FINAL

CMC Bozeman Facility Supplemental Investigation Report

Prepared for:

City of Bozeman

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ACRONYM LIST

AHERA	Asbestos Hazardous Emergency Response Act
AIHA	American Industrial Hygiene Association
ASTM	American Standard for Testing and Materials
BGS	Below Ground Surface
CARB	California Air Resources Board
CECRA	Comprehensive Environmental Cleanup and Responsibility Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
cm	Centimeter
DEQ	Montana Department of Environmental Quality
EBM	Empire Building Materials, Inc.
EPA	U.S. Environmental Protection Agency
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HVAC	Heating, Ventilation, and Air Conditioning
ISO	International Organization for Standardization
lpm	Liters per Minute
MCE	Mixed Cellulose Ester
MDT	Montana Department of Transportation
mm	Millimeter
NHB	North Harrington Building
NICET	National Institute for Certification in Engineering Technologies
NIOSH	National Institute of Occupational Safety and Health
NP	Non-Porous
NVLP	National Voluntary Laboratory Accreditation Program
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
P	Porous
PCI	Pavement Condition Index
PLM	Polarized Light Microscopy
QA/QC	Quality Assurance/Quality Control

ACRONYM LIST (continued)

RTI	Resource Technologies, Inc.
SI	Supplemental Investigation
SHB	South Harrington Building
SOW	Statement of Work
SP	Semi-Porous
TEM	Transmission Electron Microscopy
TWA	Time Weighted Average
VCP	Voluntary Cleanup Plan

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

1.0 EXECUTIVE SUMMARY

Tetra Tech performed a Supplemental Investigation (SI) at the CMC Bozeman Facility (Facility) from December 17 – December 21, 2007, and completed test pit excavations at the Story Distributing Property on December 31, 2007, in accordance with Tetra Tech's *Final Revision – CMC Bozeman Facility Supplemental Investigation* (Work Plan) (Tetra Tech, 2007a) as referenced in the Montana Department of Environmental Quality (DEQ) December 6, 2007, approval letter. The SI focused on previously uninvestigated areas where asbestos may be located; an evaluation of pavement condition in areas suspected to contain asbestos; and, an investigation of potential airborne and settled dust concentrations of asbestos within the former ore storage/mill building and attached building addition.

The pavement assessment documented several South Wallace Avenue and City of Bozeman (City) right-of-way areas that contained a "low" Pavement Condition Index (PCI) value which is directly related to deterioration or deterioration potential of these surfaces. The surfaces evaluated were asphalt roadways/parking lots, concrete sidewalks, concrete curbs and gutters, and additional paved areas that surround buildings. Most areas were acceptable with an overall "fair-to-good" rating; however, some areas were significantly deteriorated and/or damaged. These significantly deteriorated and/or damaged areas of pavement, as well as those areas where utility work may occur, may present a potential risk for future human exposure to asbestos ore and should be addressed as part of an addendum to the DEQ-Approved 2002 Voluntary Cleanup Plan (VCP) for the Facility.

The test pit investigation focused on the alley south of Heeb's East Main Grocery (Heeb's), the Harrington property along the east elevation of the South Harrington Building (SHB), and the Story Distributing property – from the north property boundary line to 15 feet south, into the Story Distributing property. These areas were found intermittently to be visually contaminated with anthophyllite (asbestos ore) at depths ranging from 1 to 4 feet. Five test pits were excavated in the alley behind Heeb's, six test pits were excavated on the east side of the SHB, and seven test pits were excavated from the Harrington/Story Distributing property. Composite soil samples were collected for laboratory analysis from the side walls of each test pit across intervals where there was no visible asbestos was observed. Additionally, grab samples were collected from the base of each test pit, where no visible asbestos ore was noted. None of the composite or base samples contained detectable traces of asbestos. Throughout the test pit excavations, none of the environmental upwind, work zone, or downwind air samples contained detectable quantities of airborne asbestos fibers.

The dust samples collected throughout areas of the North and South Harrington buildings did not indicate a detectable quantity of anthophyllite structures throughout each level and Heating, Ventilation, and Air Conditioning (HVAC) zone in each building; rather, a single sample contained one structure of chrysotile asbestos and one structure of amosite asbestos. These fibers may have come from a variety of sources in the building or surrounding exterior environments; however, they were detected at levels below the detection limit for ASTM D 5755-03.

The occupational air samples collected during work activities performed in the North Harrington Building (NHB) during normal business actives for two consecutive days did not indicate a detectible quantity of airborne asbestos fibers. Mr. Jeff Harrington, owner of Harrington's Attic, a new and used furniture store, donned the sampling train for two consecutive days while working in the sales office, main floor, basement, attic, and loading dock of this building.

Based on this SI, Tetra Tech recommends the excavation and removal of all accessible soils containing asbestos along the east and south sides of the Harrington's building and on Story Distributing property, the alley behind Heeb's, and the Empire Building Materials property. Further, Tetra Tech recommends the implementation of a combination of protective paving and encapsulation measures, institutional control measures, and an Operations and Maintenance plan, for those inaccessible areas where asbestos contamination is known to exist or has the potential to exist. These areas include South Wallace Avenue and associated right-of-way, areas beneath buildings, and other paved areas.

2.0 BACKGROUND

On behalf of the City, Tetra Tech has prepared and is submitting this SI Report, for the CMC Bozeman Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Facility **Figure 1**. This SI was conducted to satisfy a DEQ requirement for additional investigation of specific areas in the Facility as documented to the City in a Proper and Expeditious Letter and Scope of Work (SOW) dated November 22, 2006. Work was conducted in accordance with a Work Log Plan (Tetra Tech 2007a) approved by DEQ on December 6, 2007. Documents, such as the 2002 VCP for this Facility, containing information appropriate and relevant to the SI are cited herein and incorporated by reference.

2.1 SITE CHARACTERIZATION SUMMARY

The additional properties addressed in this SI are part of the existing CMC Bozeman CECRA Facility. The City requested and gained access from the owners of the Harrington property, Heeb's property, and Story Distributing, Inc. property to allow characterization of these additional areas of the Facility.

A comprehensive site characterization summary of the CMC Bozeman Facility is presented in Section 4.0 of *Environmental Assessment in the Voluntary Cleanup Plan for the CMC East Main Depot* (RTI 2002a). Previous investigations along the right-of-way west of Empire Building Materials, Inc. (EBM) revealed asbestos at a depth of 2.5 – 3.0 feet beneath ground surface (BGS) imbedded in utility concrete conduits. The asbestos was observed while digging test pits to depths of approximately one to four feet BGS by RTI (VCP Addendum Construction Completion Report dated August, 2004 (RTI, 2004) and RTI's VCP Addendum Report dated October 9, 2003 (RTI, October 9, 2003)). During RTI's supervision of the cleanup, asbestos contaminated soil was noted to have been removed down to the concrete with imbedded asbestos as well as in the area of a small piece of observable asbestos noted in the south excavation wall adjoining the NHB property line (*Revision 1, Addendum to the Voluntary Cleanup Plan for the CMC East Main Depot Facility, Bozeman, Montana* (RTI, September 23, 2003)). Additionally, RTI's previous soil investigations indicated visible asbestos in Test Pit Nos. 02-2 and 03-5, 03-7, and 03-2 and 03-3 and visible asbestos beneath the north asphalt driveway pavement of the NHB, beneath the South EBM Warehouse, and throughout the gravel yard of EBM (RTI, 2004). The asbestos contaminated soils may extend further north of RTI's Test Pit No. 03-6 as there was no confirmation test pits east of Test Pit No. 03-5 and 03-7. Previously remediated areas are outlined in Section 4.0 of this report.

In Tetra Tech's *Limited Soil Investigation Results Report* for the Nash-Finch/Bozeman Public Library property, dated July 5, 2007 (Tetra Tech, 2007b), compacted sand and gravel backfill was encountered above the native dark brown silty clay material at depths from 0 to 4 feet in the four bore holes. The intent of the July 2007 investigation was to evaluate the presence of lead in native soil under paved parking areas. Note that the presence of asbestos was not evaluated, as previous investigations have shown no detectable asbestos in this area of the Facility.

During the week of August 27, 2007, asbestos was discovered by the Montana Department of Transportation (MDT) in the right-of-way along the southwest corner of Main Street and South Wallace Avenue (adjacent to Heeb's). This asbestos was found during a MDT project to remove and replace existing sidewalk, curb, and gutter along Main Street. The asbestos appeared to be used as backfill material beneath these removed surfaces. The asbestos impacted soil appeared to extend beneath the Heeb's north-facing parking lot, under the

sidewalk to the west along Main Street, and under the newly paved southwest corner of South Wallace Avenue and Main Street.

During utility work conducted on behalf of the City on October 9, 2007, additional asbestos was found in the unpaved alley behind, and to the south of Heeb's. The extent of contamination in the unpaved alley behind Heeb's was investigated as part of this SI and these additional asbestos discoveries will be addressed in an addendum to the 2002 VCP. In March of 2008 an individual who worked at the asbestos mill at 204 South Wallace in 1957, provided information to DEQ indicating that asbestos originating from a mine other than the Karst Mine was also stored and milled at the site.

2.2 PURPOSE

The purpose of this SI is to conduct additional investigation of the Facility as specified in the Work Plan (Tetra Tech, 2007a). This SI addressed the following areas and conditions:

- Previously uninvestigated areas on property owned by Harrington's, Inc. (i.e. unpaved areas);
- South and east sides and the newer southern building addition on Harrington property;
- Unpaved alley south of Heeb's Grocery Store;
- Pavement condition of known asbestos containing areas at the southwest corner of South Wallace Avenue and Main Street;
- Pavement condition of South Wallace Avenue and sidewalks within the right-of-way running south from Main Street to Curtiss Street;
- Upper (northern) portion of the Story Distributing, Inc. property; and,
- Potential airborne and settled dust concentrations of asbestos within the former ore storage/mill building and attached southern building addition on the Harrington property.

These areas are outlined on **Figure 1 and Figure 2** presents previously assessed areas of the facility. Historical documentation indicates that the original Harrington building may have been utilized for asbestos storage and/or milling during asbestos operations at the Facility. The possibility exists that any asbestos fibers present in the original building may have migrated or aerosolized (suspension of particles in air) into the more recently constructed building.

The City will prepare an addendum to the 2002 VCP for this Facility to address specific elements of the SOW not included in this investigation. These elements will include but are not limited to cleanup activities on property owned by EBM, the paved utility corridor along South Wallace Avenue, and in the alley south of Heeb's. Additional remedies may be proposed in the addendum to address remaining contamination at the Facility.

3.0 SUPPLEMENTAL INVESTIGATION METHODS

Tetra Tech conducted the following five tasks as part of the SI at the CMC Bozeman Facility:

- Site-Specific Health and Safety Plan (HASP) development;
- A pavement condition evaluation in previously uninvestigated areas on property owned by Harrington's, Inc., throughout South Wallace Avenue from Main Street south of Curtiss Street including right-of-ways, and in the alley south of Heeb's;
- A soil assessment to evaluate the extent of asbestos contamination in accessible soils on the Harrington's, Story Distributing, and the Heeb's alley properties;
- An air-related assessment to address the interior of the two structures located on the Harrington's Property; and
- Quality Assurance/Quality Control (QA/QC) program throughout all sampling events.

Figures 1 and **2** present the boundary of assessed and/or remediated areas; the approximate areas where excavation of contaminated soils has taken place and also areas that have been previously investigated.

3.1 SUPPLEMENTAL INVESTIGATION WORK PLAN

Two separate characterizations commenced at the Facility and specifically addressed the potential for asbestos in Facility soils and air-related asbestos located inside the two Harrington buildings. The ambient air, dust, soil, and pavement condition evaluation methodologies are presented in **Table I**.

TABLE 1
SAMPLE COLLECTION, PREPARATION AND ANALYSIS
CMC Bozeman Facility Supplemental Investigation

Medium	Collection/Preparation	Analytical Method
Pavement	Visual Pavement Condition Index	ASTM D5340-04
Air	ISO Method 10312	TEM
Dust	ASTM Method D5755-03	TEM
Soil	CARB Method 435	PLM with QC @ 10% TEM

3.2 SITE-SPECIFIC HEALTH AND SAFETY PLAN

Tetra Tech prepared a Site-Specific Heath and Safety Plan (HASP) for the SI based on the DEQ-approved Work Plan. The HASP conformed to the requirements in 29 CFR 1910.120, and generally follows the same health and safety principles documented in the *Health and Safety Plan for the CMC East Main Depot Site Voluntary Cleanup Bozeman, Montana*, (RTI, 2002b) and as included in the *Voluntary Cleanup Plan for the CMC East Main Depot, Revision 2*, (RTI, 2002a). Appendix B contains the project HASP.

It should be noted that the HASP required personnel and/or work zone-upwind/downwind ambient air monitoring during the exterior test pit sample collection and interior dust samples for asbestos (with respective methodology) in accordance with National Institute of Occupational Safety and Health (NIOSH) Method 7400. Sampling conducted during the test pit excavation

did not indicate the presence of a detectable quantity of airborne asbestos either upwind or downwind throughout each day of test pit collection; sampling was determined to be unnecessary during interior dust sample collection as work practices did not warrant sample collection.

The HASP stipulated that all personnel on site, including all subcontractors, will be trained as required by the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) 29 CFR 1910.120 standard and provide proof of such training. Due to the presence of potential hazardous substances on site, Tetra Tech required excavation subcontractors to participate in a respiratory protection program as defined in 29 CFR 1910.134. As required under this OSHA standard, all personnel on site were required to receive physician's approval before wearing negative pressure air-purifying respirators and receive fit testing for the specific respirators worn. Prior to the onset of work, Tetra Tech informed and provided the excavation subcontractor with the HASP as well as necessary training prior to starting work. Documentation of this required training is included in Appendix B.

3.3 PAVEMENT CONDITION ASSESSMENT

Tetra Tech performed an evaluation of the existing pavement conditions, given current property uses, and potential for future required utility work. The pavement assessment was conducted as part of an evaluation of the potential for exposure to asbestos from paved areas of the Facility. During the evaluation an assumption was made that all Facility-defined areas addressed in this SI have the potential to contain asbestos as "fill" material beneath both paved and unpaved areas. Pavement areas which were addressed primarily include South Wallace Avenue (from Main Street to Curtiss Street) including but not limited to areas beneath sidewalks and curbs, alleys that may contain pavement, and the parking lots of Heeb's and Harrington's (**Figure 2**).

The pavement condition assessment was conducted in accordance with use of a modified version of American Standard for Testing and Materials (ASTM) Method D5340-04 *Standard Test Method for Airport Pavement Condition Index Surveys*. This test method covers the determination of airport pavement condition through visual surveys of asphalt-surfaced pavements, including porous friction courses, and plain or reinforced jointed Portland cement concrete pavements, using the Pavement Condition Index (PCI) method of quantifying pavement condition. ASTM Method D5340-04 documentation is included in the SI Work Plan (Tetra Tech 2007a). Tetra Tech used the PCI to evaluate the relative condition of the pavements and the potential for release of asbestos from soils beneath the pavement (i.e. pavements that are deemed to be damaged have a higher risk of exposure to sub-grade asbestos).

3.4 SOIL SAMPLING

Generally, exterior asbestos soil sampling consisted of completing a visual assessment and/or using test pit soil sampling methodologies. The visual assessment was completed for all test pit locations and consisted of documenting visible asbestos throughout the stratified layers of soil. Visible asbestos documentation was completed in accordance with a modified version of ASTM Method E 1386-05: *Standard Practice for Visual Inspection of Asbestos Abatement Projects*. Additionally, all visual inspections of each test pit were conducted by an Asbestos Hazardous Emergency Response Act (AHERA)-accredited asbestos inspector and/or a Certified Industrial Hygienist (CIH). Documentation of accreditation is included in Appendix C.

If asbestos was noted through visual inspection in a test pit, Tetra Tech did not collect a sample for laboratory analysis. The depth of the observed asbestos was just documented on the test pit log. If visible asbestos was not noted, soil samples were collected at 6-inch depth intervals from the vertical and horizontal extent of each test pit and submitted for laboratory analysis of asbestos. In this instance, the vertical extent is characterized with one grab sample from the floor of the excavation (base sample). The horizontal extent is identified as the northerly, southerly, easterly, and westerly locations along the test pit walls from which four samples were collected and composited into one (composite sample). The pit wall composite sample consisted of soil collected at 6-inch intervals to the base of the completed test pit.

Asbestos has been found in Facility soils at the surface and from depths up to 3-feet BGS. The asbestos is often mixed with native soil and/or fill material. Tetra Tech subcontracted a licensed and insured excavation company to use a backhoe to dig test pits for the collection of soil samples. The protocol for determining the depth of the test pits and the collection of soil samples at the Facility was as follows:

- Test pits were dug to a minimum depth of 3 ft BGS.
- Soil samples for laboratory analysis were only collected when no visible asbestos had been observed at a given depth or depth interval.
- If visible asbestos was present at 3-feet BGS, excavation continued until visible asbestos was no longer present; A single composite soil sample was then collected from the side walls for the depth interval where asbestos was not observed (e.g., if asbestos was observed from 2 to 3 ft BGS in a 4 ft deep test pit, then composite samples were collected from 0 to 2 ft and from 3 to 4 ft.
- If asbestos was not visibly present in a test pit, the excavation was advanced to around 3-feet and a composite sidewall sample and a base sample were collected.
- A soil sample was also collected from the base of the excavation at its deepest point (which always corresponded to a depth at which no asbestos was observed).

Six test pits were excavated from the area east of the SHB and three composite and six grab samples were collected. Visible asbestos was present throughout SHB TP1, TP3, and TP6; however, no visible asbestos noted in SHB TP2. SHB TP4 and TP5 contained small visible pieces of asbestos as noted in the test pit logs and **Table 3.** Tetra Tech collected composite samples to represent the majority of soils in the test pits. Seven test pits were excavated from the Story Distributing property and, six composite and six grab samples were collected. Five test pits were excavated from the alley behind Heeb's and five composite and five grab samples were collected. After test pit sample collection, Tetra Tech's subcontractor backfilled and bucket-compacted all excavations.

Asbestos soil samples were collected from excavation walls at 6-inch depth intervals in each test pit and placed in pre-labeled plastic sampling containers. Samples were visually screened to evaluate whether visible asbestos was present. One duplicate sample was collected of the entire vertical depth sampled with the same amount of soil collected from each 6-inch sub sample, and two duplicate samples were collected from the sample base. Samples were collected using clean mixing bowls and hand trowels. Between test pit locations, Tetra Tech field personnel donned a new pair of nitrile gloves and decontaminated the mixing bowls and hand trowels to prevent cross-contamination.

Tetra Tech followed the Unified Soil Classification system (ASTM D-2487-92 and ASTM D-2488-93) to describe soils in each test pit. This data is presented on a standard test pit log form (Appendix E). Additionally, Tetra Tech documented each test pit location using a Global Positioning System (GPS), appropriate measurements in reference to existing structures, and photographs with each sample identification number. GPS locations are presented on the test pit log forms and the photographs are presented in Appendix F.

Following the collection of samples, chain-of-custody procedures were used to establish a written record of sample handling and movement between the sampling site and the laboratory. Each shipping container had a chain-of-custody form completed in duplicate by sampling personnel. Tetra Tech kept one copy of this form and the other copy was sent to the laboratory. The shipping container was sealed so that it was obvious if the seal had been tampered with or broken; none of the sampling container seals were broken on arrival to the laboratory.

3.4.1 Soil Sample Analysis

The asbestos content in soils was determined through visual inspection and using a modified "bore hole sampling methodology" of California Air Resources Board (CARB) Method 435: *Determination of Asbestos Content of Serpentine Aggregate* as documented in the SI Work Plan (Tetra Tech, 2007a). This preparation methodology states that a minimum of three samples must be submitted per "area" sampled. This soil analysis method was chosen to document the asbestos content in soils. Per the method, each composite sample was crushed to produce a material with a nominal size of less than three-eighths of an inch. Before crushing, the sample was dried.

ASTM Method C-702-80 was used to reduce the size of the crushed grab sample to a one pint aliquot. The one pint aliquot was further crushed using a Braun mill or equivalent to produce a material of which the majority was less than 200 Tyler mesh.

Soil samples were analyzed using the CARB Method 435 preparation, followed by analysis using polarized light microscopy (PLM) to 0.25 percent. The CARB Method 435 contains an abbreviated PLM analysis, but the more comprehensive PLM analysis, as outlined in U.S. Environmental Protection Agency (EPA) Method 600/R-93/116 was used.

3.5 ASBESTOS AIR-RELATED SAMPLING

It is believed that the original Harrington's building, located in the 2000 block of S. Wallace, Avenue, was used as an asbestos storage building and/or for the processing of asbestos. Objectives of sampling were to define the nature and extent of any asbestos contamination of the indoor air in the Harrington's structures, and to determine the exposure potential to those who utilize the building.

To determine if air-related surficial asbestos contamination was located in the Harrington buildings, Tetra Tech collected dust samples using ASTM D 5755-03 and air samples in accordance with International Organization for Standardization (ISO) Method 10312:1995, as described in the SI Work Plan (Tetra Tech 2007a). Tetra Tech collected dust samples in specified zones in both buildings using ASTM D 5755-03. Based on recent information indicating a lack of correlation between asbestos concentrations in dust samples and concentrations in air, the EPA has determined that the collection of dust samples alone will not adequately assess potential indoor sources of exposure. As a result, Tetra Tech also collected

activity-based air samples during building owner/employer work activities throughout a typical workday.

3.5.1 Asbestos Dust Sampling

Asbestos dust sampling was performed using ASTM D 5755-03, *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Surface Loading*. Using this methodology, Tetra Tech collected a minimum of one composite sample per building with the following parameters:

- Each composite sample consisted of 10 sub samples (aliquots) per work area in the building (a work area is defined as a segregated section in the building (e.g., office space, shop, etc.)) using the following ratio of sub sample locations:
  - Four accessible areas;
  - Four infrequently accessed areas; and,
  - Two inaccessible areas.

- When possible, the sample order included collection of one sub sample initially from each of these areas (i.e. one accessible location, one infrequently accessed and one inaccessible area), so if filter loading occurred the collected sample was representative of all three areas.

- One composite sample was collected for each floor of each building on the property;

- When possible, one composite sample was collected for each separate HVAC system per floor of each zone in each building per property; and,

- One composite sample was collected inside the return plenum of each HVAC zone in each building.

A sub sample consisted of collecting ten (10) -100 centimeter (cm) x 100 cm samples throughout these defined composited spaces. A single template was used for each composite sample; therefore, per each aliquot in the composite sample, a single template was used. For each aliquot, Tetra Tech sampled the dust surface for approximately one minute to give a total of approximately 10 minutes for each sample collected. During the collection of each aliquot – with use of the respective 25-mm sampling media cassette – Tetra Tech covered the sampling surface and collected 15-second sub samples in the following directions from within the template area:

- Side-to-side across the entire width and length of the template;

- Top-to-bottom across the entire width and length of the template;

- Northwest corner to southeast corner across the entire width and length of the template horizontally; and,

- Southwest corner to northeast corner across the entire width and length of the template horizontally.

Tetra Tech's decontamination procedure consisted of disposal of plastic gloves per composite sampling event, disposal of the template per composite sampling event, and use of a separate cassette in-between each composite sampling event.

While ASTM D 5755-95 requires the identification of fibers with a 5:1 aspect ratio, Tetra Tech requested an aspect ratio of 3:1 be analyzed by the laboratory due to recent research involving amphibole asbestos risks associated with fiber sizes less than 5 microns in length. Additionally, Tetra Tech increased the target analytical sensitivity to 20 structures per square centimeter based upon increased aliquot points – as discussed above – in the initial sampling.

Samples were generally collected from "dusty" areas (areas that may not have been cleaned previously) and were collected from horizontal surfaces in each composite area; however, "non-dusty" surfaces encountered (routinely cleaned areas along the floor, window sills, frequently vacuumed area) were also sampled. The type of each surface sampled was documented as porous (P), semi-porous (SP), or non-porous (NP) (carpet, wood, floor tile/waxed or varnished wood, respectively) and was labeled on a floor plan figure and documented in the following manner(s):

- South Harrington Building, Composite Sample 10, Sub sample 7, Porous Surface
  - SHB-10-7-P.
- North Harrington Building, Composite Sample 10, Sub sample 6, Semi Porous Surface
  - NHB-10-6-SP

Tetra Tech documented each sampling location, building level, specific type of surface, and accessibility of each aliquot from each collected sample.

More specifically, Tetra Tech collected samples from the following composite locations with sub sample identification noted onsite:

- North Harrington Building
  - Basement: Shop/Office/Vault, HVAC Room, Showroom
  - Main Level: Bitterroot Stained Glass Shop and Storage Room, Main Office/Storage Room No. 1 & No. 2, Showroom/Closet, East Dock Area, and Southwest Office/Men's and Women's Restrooms
  - Attic Level: South Showroom, North Showroom, and Break room/East Office/Hallway.
  - 3rd Level: Big Sky Aikido
- South Harrington Building
  - Salvation Army Shop & Bathroom

Analysis indicated the type of asbestos (if any) present on each composite area analyzed. Analysis was completed using transmission electron microscopy (TEM). Through use of TEM analysis for all dust and air samples analyzed, Tetra Tech was able to differentiate between the different types of asbestos present on the sample medium.

Samples were handled in accordance with ASTM D 5755-03, which included donning a new pair of nitrile gloves between composite sample locations prior to each sample. A chain-of-custody form was filled out for each composite sample, with documentation of all aliquot sample identification numbers included for that sample.

Analysis was completed by EMSL Analytical Laboratories, Inc. in West Mont, New Jersey, for all samples. EMSL is accredited by the American Industrial Hygiene Association (AIHA) for asbestos analysis and participates in National Voluntary Laboratory Accreditation Program (NVLAP). By use of TEM for all dust and air samples analyzed, Tetra Tech was able to differentiate between the types of asbestos present on the sample medium and therefore, determine whether the specific morphology and crystallization was associated with the Karst Mine anthophyllite.

3.5.2 Asbestos Air Sampling

For the use of ISO Method 10312:1995, *Ambient Air – Determination of Asbestos Fibers – Direct Transmission Electron Microscopy Method,* Tetra Tech collected activity-based air samples throughout two 8-hour work periods via personal air monitoring of Harrington attic employees at the Harrington North building during an average work day. During a September 12, 2007, site visit, Jeff Harrington indicated he preferred that he and/or another employee participate in sample collection. Typical daily work activities (tasks) include cleaning and moving furniture, furniture sales, office work, limited janitorial duties, and management duties (including observing employees performing all above-mentioned duties).

The 25 millimeter (mm) conductive cowl cassette with 0.45 micron pore size mixed cellulose ester (MCE) sampling filter backed by a 5.0 micron pore size MCE filter were worn by Mr. Harrington within 7-inches of the mouth/nose area throughout the duration of the sampling period. Prior to and after sample collection the flow rate of the sampling pump was calibrated to 2.0 liters per minute (lpm) using a primary source. If samples were found to be out of tolerance by +/- 10 percent of the initial calibrated flow rate, the sample would have been considered void and a retest would have been performed. No retests were performed. All field equipment was decontaminated using wet wipes prior to the start of sampling, in-between sampling events, and after sampling events to prevent contamination of the equipment.

The analysis was conducted using TEM by EMSL Analytical Laboratories, Inc. in West Mont, New Jersey. This laboratory participates in the NVLAP and conducted the analysis in accordance with the specifications found in ISO 10312 including but not limited to the following procedures:

- Analytical Sensitivity (0.0002 cc^{-1});
- Filter Overload Target set at 10 percent with the laboratory notifying Tetra Tech of any overloaded filters prior to proceeding with analysis;
- Counting Rules specifying that the laboratory read a minimum of 10 grid openings and continue to count structures until the required analytical sensitivity has been reached, based on the sample volume and the number of grid openings counted. The count may be terminated upon completion of the grid opening containing the 50^{th} structure, regardless of whether or not the target analytical sensitivity has been reached; and,
- A media blank and a field blank from the same sample media lot were submitted to the laboratory for quality control.

4.0 RESULTS AND ANALYSIS

Tetra Tech conducted field work for the SI from December 17 - 21, 2007 and additionally on June 11, 2008, for the pavement condition assessment, air-related sampling inside the Harrington buildings, and test pit excavations for the east side of the South Harrington building and the alley behind Heeb's. Tetra Tech returned to the project site and finished with the test pit excavation of the Story Distributing property on December 31, 2007. All work was performed in accordance with the SI Work Plan (Tetra Tech 2007a). The collected data is presented in tabular form, and the results are discussed and analyzed in the associated subsections below.

4.1 PAVEMENT CONDITION ASSESSMENT

On December 18 and 19, 2007, and additionally on June 11, 2008, Tetra Tech conducted a pavement condition assessment throughout the following areas: South Wallace Avenue from Main Street to Curtiss Street (including areas beneath sidewalks and curbs), alleys that may contain pavement, and the parking lots of Heeb's and Harrington's. The assessment used the PCI methodology (modified from ASTM D 5340-04) and specifically included the right-of-way areas along the west and east sides of South Wallace Avenue.

Pavement rated as highly degraded may require replacement, pavement that is moderately degraded may need repair and maintenance work, and paved areas with a low degradation rating may not require repair or replacement at this time. The PCI provides a quantitative rating to allow for a qualitative assessment of the pavement surfaces. Priority of action is defined as High, Moderate, and Low where a High rating would suggest immediate replacement action. A Moderate rating would suggest that immediate repair or preventative maintenance action be taken. Low rating suggests no immediate action is required; however, an O&M evaluation should be conducted yearly.

During the initial assessment some areas were not readily accessible for assessment purposes due to inclement weather conditions; however, these areas were assessed along with additional apron areas in the Heeb's alley in June, 2008. Mr. Jess Whitford, Construction Materials Manager, with National Institute for Certification in Engineering Technologies (NICET) Level IV (highest level) certification performed the assessment along with Mr. Marco Fellin, Professional Engineer (PE), a geotechnical engineer. Tetra Tech's Revised *CMC Bozeman Facility: Pavement Assessment* (Tetra Tech 2008) is provided in Appendix D. This report provides documentation of the aforementioned areas along South Wallace Avenue which contain pavement-covered surfaces that are deteriorated and/or damaged.

The following is a general assessment of the condition of pavement along South Wallace Avenue in the study area with respect to the Low, Moderate, and High levels of pavement deterioration from the PCI:

- Main Street to Babcock Street is rated Moderate due to the increased traffic flow through this area;
- Babcock Street to Olive Street is rated Low; and
- Olive Street to Curtiss Street and beyond is rated Low.

It should be noted that within these street segments localized areas of Moderate or High levels of deterioration exist. **Figure 3** outlines the "damaged" asphaltic pavement areas of South Wallace Avenue. Areas that are not defined contain no damage. **Table 2** provides documentation of the concrete surfaces that were considered to have High or Moderate deterioration. This includes sidewalks, gutters, curbs and portions of some driveways. This data is not presented on a figure because the small sizes of the features make it difficult to show at the scale of the maps used in this report.

TABLE 2
SIDEWALK, CURB AND GUTTER ASSESSMENT: SOUTH WALLACE AVENUE
Concrete with High to Moderate Degradation

Section	PCI	Rating
Gutter: Curtiss Street Valley Gutter	56	Moderate
Driveway: west side of South Wallace Avenue between Curtiss Street and Olive Street; Parking Lot entrance Apron	50	Moderate
Curb: west side of South Wallace Avenue, 142' north of Curtiss Street to Parking Lot entrance apron	50	Moderate
Curb: northwest radius on Olive Street	18	High
Curb: west side of South Wallace Avenue, Olive Street to Babcock Street	44	Moderate
Sidewalk: west side of South Wallace Avenue, First 22 section north of Olive Street	55	Moderate
Sidewalk: west side of South Wallace Avenue, Sections 39-46 north of Olive Street	0	High
Sidewalk: west side of South Wallace Avenue, east end of Heeb's Market, (60' length)	32	High
Sidewalk: west side of South Wallace Avenue from northeast corner of Heeb's Market, to Parking Lot entrance apron	42	Moderate
Driveway: south of alley behind Heeb's Market west of South Wallace Avenue	30	High
Driveway: south of alley behind Heeb's approximately 100 feet west of South Wallace Avenue	42	Moderate

Tetra used the PCI ratings to evaluate the potential for release of asbestos fibers in areas where asbestos may be present in soils beneath paved surfaces. Although all of these asphalt-covered areas have the potential to incur damage in the future, Tetra Tech's interpretation to the referenced ASTM Method indicates that only those areas with High or Moderate ratings contain the potential for asbestos exposure at the Facility in the immediate future. These areas are outlined in **Figure 4**.

The timing of pavement replacement in this area by the City will be primarily dependent upon pavement condition and utility replacement. City water and sewer maps indicate that the existing water main's composition along South Wallace Avenue is cast iron, the existing sewer line from south of Curtiss Street to directly north of Olive Street is polyvinyl chloride (PVC), and the existing sewer line from directly north of Olive Street to East Main is clay, as shown on **Figure 3**. The life of cast iron is typically around 40 to 60 years dependant on the conductivity and pH of the soil surrounding the cast iron, the turbidity of the water inside the water main, and the chemical composition of the water contents of the main. Therefore, this main will require repairs and/or replacement in the future. The City may also determine the need to repair/replace the clay sewer line in the future. The PVC sewer line was replaced in the previous 20 years.

The EPA guideline for exposure assessment as documented in EPA Federal Register Notice: *Guidelines for Exposure Assessment* EPA Document No. 600/-Z-92/001, indicates the following additional environmental concerns for release and transport for the potential fate of the asbestos:

1. Common intrusive activities performed by residents (due to the right-of-way extending to the sidewalks which are approximately 6-feet from the curb stops)

    a. Rototilling of soils in flower and vegetable gardens;
    b. Rototilling for installing new landscaping when the existing lawn is dead;
    c. Digging holes for planting trees and bushes;
    d. Disturbance of the grass-covered yard soil from activities such as weeding, mowing the grass, aerating, and habitual digging by pets and wild animals;
    e. Disturbances of sparsely vegetated areas of yard by walking, playing, biking, mowing, etc.;
    f. Management of excavated soils by bagging and floor sweeping; and,
    g. Disturbance by children of exposed soils.

2. Natural processes

    a. Forces exerted by wind currents on existing free asbestos fibers in soil at the surface or excavated soils due to the above activities; and,
    b. Forces exerted on asbestos-containing debris by shifting soils due to extreme changes in temperature, precipitation, or other natural processes.

3. Examples of activities that may result in large amounts of excavated soils and a resultant on-going source of asbestos release in air

    a. Planting trees or bushes;
    b. Excavating dead trees and bushes;
    c. Outdoor minor construction such as installing an in-ground hot tub, play equipment, deck, patio fences or other structures;
    d. Installing or repairing sprinkler systems;
    e. Installing decorative pathways on the grass-covered yard; and,
    f. Performing maintenance on underground utility service lines.

4. Examples of mechanisms by which asbestos may be transported outdoors or indoors

    a. Wind transport though open doors and windows; and,
    b. Track-in of adhered fibers on clothing and shoes of children, adults, and animals.

4.2 SOIL SAMPLING

Tetra Tech performed soil sampling and characterization throughout three separate areas at the Facility from December 19 - 28, 2007. All field work was conducted in accordance with methodology detailed in Section 3.4. A summary of the results and characterization of the soil samples collected by this investigation are presented below. Soil sample locations from this and previous investigations are presented on **Figure 5**.

4.2.1 South Harrington Building

The South Harrington building (SHB) was assessed on December 19, 2007. The assessed area was along the east side of the building and consisted of an approximately 7-foot wide by 100-foot long area of soil along the exterior concrete foundation/footing wall on the east side of the SHB and against the exterior concrete foundation/footing wall of the south North Harrington Building (NHB) dock. This SI area adjoined the "Previously Assessed Area" near the City library as documented in **Figure 2**. Visual assessment indicated the presence of asbestos in five of the six test pits (SHB TP-1, SHB TP-2, SHB TP-3, SHB TP-4, and SHB TP-6) with depths ranging from 0.5-feet to 4.0-feet BGS. Soil sampling results, visual observations of asbestos and the locations of each test pit relative to existing structures are presented on test pits logs in Appendix E and photographs of the test pits are presented in Appendix F. The wall and base of SHB TP-2 did not indicate observable asbestos; however, visible asbestos was noted in the pile of soils removed from the test pit (test pit tailings); therefore, the depth interval of the asbestos is unknown. Test pit logs additionally document different soil classifications and where native soil was encountered.

In test pits where native material was encountered at a depth less than three feet, a base sample was collected from the asbestos/native soil interface at 2.5 feet in depth. These test pits were advanced to three feet and the logs noted no visible asbestos. A cross-section of this area is shown on **Figure 6**. Tetra Tech estimates the volume of asbestos is 5.0 cubic yards (yd^3) using actual depth intervals with visible asbestos, however, we estimate 80 yd^3 will need to be removed due to over-excavation, and the likelihood of discovering asbestos not encountered by the test pits . This should be considered a more likely waste volume for this area. With an estimated volume of 80 yd^3, and assuming a 30 percent contingency, this equates to approximately 104 yd^3 of asbestos impacted soil to be removed. Tetra Tech's calculations are included in Appendix G.

Test pit data from the composite and base of each test pit is presented in **Table 3**. It should be noted that none of the laboratory samples reported a detectable concentration of anthophyllite asbestos. Laboratory soil analytical results are presented in Appendix H.

Based on visual evidence of asbestos within the test pit excavations and the randomness of test pit locations, it is Tetra Tech's opinion that all soils along the east side of the SHB are contaminated with asbestos to each respective test pit depth. All volume calculations have been based on these assumptions.

TABLE 3
SOUTH HARRINGTON BUILDING SOIL SAMPLE RESULTS
Composite and Base Samples for SHB TP-1 through SHB TP-6

Test Pit (TP) Sample Number with Soil Classification	Location of Sample*	Sample Depth (FT)	Asbestos Soil Result	Visual Observation of Asbestos
10 SHB TP-1; Dark Brown Clayey Silts w/no or very little gravels	Base	4.0	ND**	Visual observation to 3.5 ft
11 SHB TP-2; Dark Brown Clayey Silts w/no or very little gravels	Base	4.0	ND	Visual observation to 3.5
12 SHB TP-2; 12"-minus with poorly graded sandy soil with gravels	Side Wall Composite	0 – 3.0	ND	Asbestos in soils removed from test pit***
13 SHB TP-3; Dark Brown Clayey Silts w/no or very little gravels	Base	2.5	ND	Visual asbestos to 2ft
14 SHB TP-4; Dark Brown Clayey Silts w/no or very little gravels	Base	4.0	ND	Visual asbestos to 3.5 ft
15 SHB TP-4; 10"-minus with poorly graded sandy soil with gravels	Side Wall Composite	0 – 3.0	ND	Asbestos in soils removed from test pit***
16 SHB TP-5; Dark Brown Clayey Silts w/no or very little gravels	Base	2.5	ND	No visual asbestos
17 SHB TP-5; 10"-minus with poorly graded sandy soil with gravels	Side Wall Composite	0 – 2.5	ND	Asbestos in soils removed from test pit***
18 SHB TP-6; 10"-minus with poorly graded sandy soil with gravels	Base	2.5	ND	No visual asbestos

* Where no composite sample is identified for a specific test pit, the asbestos was present to the full depth of the pit.
** ND = None Detected based upon 0.25% Target Analytical Sensitivity with CARB 435
*** Asbestos visually noted in excavation material alongside test pit but not in test pit

4.2.2 Heeb's

The alley directly south of the Heeb's Grocery building was assessed on December 20, 2007. The assessed area consisted of an approximately 18-foot wide by 158-foot long area of soil that extends from the exterior concrete foundation/footing wall of the Heeb's building, across the alley and to the north edge of adjoining properties on the south side of the alley (residential properties and an apartment complex). The assessed area is outlined on **Figure 2.**

Soil sample results from test pit bases and pit wall composites are presented in Table 4. It should be noted that none of the test pits samples submitted for laboratory analysis indicated a detectable concentration of anthophyllite asbestos. Laboratory soil analytical results are located in Appendix H.

With the exception of Heeb's TP-2, the visual assessment indicated the presence of asbestos in all of the test pits excavated in this area (**Figure 7**). Asbestos was observed on the soil surface and to a depth of 1.5-feet below ground surface in four of the five test pits located along the north and south edges of the alley. It is Tetra Tech's opinion that the asbestos is present throughout the assessed portion of the alley, hence the entire area has been included in waste volume calculations. Test pits logs and presented in Appendix E and photographs of the test pits are presented in Appendix F, with locations for each test pit noted with respect to existing structures. In addition to the test pits, visible asbestos was observed within two to three feet of test pit TP-2 along a concrete driveway. The test pit logs additionally document soil classifications and the depths at which native soil was encountered.

TABLE 4
HEEB'S ALLEY BUILDING SOIL SAMPLE RESULTS
Composite and Base Samples for HEEB's TP-1 through HEEB's TP-5

Test Pit (TP) Sample Number with Soil Classification	Location of Sample*	Sample Depth (FT)	Asbestos Soil Result	Visual Observation of Asbestos
1 HEEBS TP-1; Brown Clayey Silts w/no or very little gravels	Base	3.0*	ND**	Visual asbestos 0-3
2 HEEBS TP-2; Brown Clayey Silts w/no or very little gravels	Base	3.0	ND	No visual asbestos
3 HEEBS TP-2; Dark Brown 5-inch minus road mix with gravels	Pit Wall Composite	0 – 3.0***	ND	No visual asbestos
4 HEEBS TP-3; Brown Clayey Silts w/no or very little gravels	Base	3.0	ND	Visual asbestos 0-3
5 HEEBS TP-3; Dark Brown 5-inch minus road mix with gravels	Pit Wall Composite	0 – 3.0	ND	No visual asbestos
6 HEEBS TP-4; Brown Clayey Silts w/no or very little gravels	Base	3.0	ND	Visual asbestos 0-5
7 HEEBS TP-4; Brown Clayey Silts w/no or very little gravels	Pit Wall Composite	1.5 – 3.0	ND	Visual asbestos 0-5
8 HEEBS TP-5; Brown Clayey Silts w/no or very little gravels	Base	3.0	ND	Visual asbestos 0-1.5
9 HEEBS TP-5; Brown Clayey Silts w/no or very little gravels	Pit Wall Composite	1.5 – 3.0	ND	Visual asbestos 0-1.5

* Where no composite sample is identified for a specific test pit, the asbestos was present to the full depth of that test pit.
** ND = None Detected based upon 0.25% Target Analytical Sensitivity with CARB 435
*** Asbestos was observed in expansion joint of concrete driveway near this excavation

Tetra Tech collected samples from the following five test pits: Heeb's TP-1, Heeb's TP-2, Heeb's TP-3, Heeb's TP-4, and Heeb's TP-5. Samples were collected from the base of each test pit down to the 3-foot minimum test pit depth. A cross-section summarizing the test pit findings is shown on **Figure 7**. Tetra Tech estimates the actual volume of asbestos contaminated soil is 123 yd^3, however we estimate 227 yd^3 of soil will need to be removed due to over-excavation and the likelihood of discovering asbestos not encountered by the test pits. With an estimated volume of 227 yd^3, and assuming a 30 percent contingency, this equates to approximately 295 yd^3 of asbestos to be removed. Tetra Tech's calculations are included in Appendix G.

Based on visual evidence of asbestos in four of five completed test pits and on the surface in two locations along the alley, it is Tetra Tech's opinion that soils along the alley south of the Heeb's building are contaminated with asbestos to a depth of approximately 1.5 feet. All volume calculations have been based on these assumptions. In addition, it is likely that asbestos impacted soil found in the alley behind Heeb's was used as "fill" material to increase the elevation of the alley prior to construction of the apartment complex (located southwest of Heeb's). Tetra Tech understands the "fill" material was added to allow for a proper apron assisting the apartment complex patron with access from/into the alley. It is with this knowledge that Tetra Tech suggests that the asbestos "fill" material may extend beneath the apartment complex north apron and westerly down the rest of the length of the alley.

4.2.3 Story Distributing Property

The Story Distributing property was assessed on December 28, 2007. The assessed area consisted of an approximately 100-foot wide by 15-foot long area of soil along the exterior concrete foundation/footing wall 15 ft south of the SHB (**Figure 8**). This SI area adjoined the

previously assessed area on the City library property. The visual assessment indicated the presence of asbestos from depths of 0.0-feet to 3.5-feet in the seven test pits in this assessment area as shown on test pits logs and photographs in Appendices E and F, respectively. The location for each test pit is presented on the logs with respect to existing structures. Tetra Tech collected samples from the following six test pits: Story TP-1, Story TP-2, Story TP-3, Story TP-4, Story TP-5, and Story TP-7; Tetra Tech did not collect additional soil samples from Story TP-6 as this test pit only contained engineered 1½-inch minus road base material due to this location's former documented excavation (RTI, 2004). Test pit logs additionally document soil classifications and depths at which native soil was encountered. Only test pits Story TP-1 through Story TP-3 were documented as containing visible asbestos. No visible asbestos was noted on the surface at the time of sampling. A cross-section summarizing the test pit findings of this area along with native soil depths is shown on **Figure 8**.

Tetra Tech estimates the actual volume of asbestos contaminated soil is 64 yd^3, as represented by visible asbestos in each test pit. However, we estimate 78 yd^3 of soils will need to be removed due to over-excavation and discovery of materials not encountered by the test pits. With an estimated "bank" volume of 78 yd^3, and assuming a 30 percent contingency, this equates to approximately 101 yd^3 of asbestos to be removed. Tetra Tech's calculations are included in Appendix G.

Soil sample results from test pit bases and pit wall composites are presented in **Table 5**. It should be noted that none of the test pits samples submitted for laboratory analysis indicated a detectable concentration of anthophyllite asbestos. Laboratory soil analytical results are presented in Appendix H.

Based on evaluation of visual evidence of asbestos in test pits it is Tetra Tech's opinion that soils along the north side of the Story Distributing property are contaminated with asbestos to the depths shown in **Table 5**. All volume calculations have been based on these assumptions and the assumption that the volumetric waste extended up to the nearest test pit that did not indicate any asbestos. For these volumetric waste calculations, the double end area method was used. Additionally, it is Tetra Tech's opinion, based on previous site experience, that asbestos may need to be remediated further south of the boundary established by this SI. This is due to the sampling methodologies previously used to determine the nature and extent of anthophyllite presence on the Story Property.

Based upon the findings of the soil sampling program on the South Harrington Building, Heeb's and Story Distributing properties, we have identified areas where asbestos has either been observed or may potentially exist. These areas are outlined on **Figure 9**. These areas were identified based upon evaluation of soil sample results and observations collected to date by this and previous investigations at the Facility.

TABLE 5
STORY DISTRIBUTING PROPERTY SOIL SAMPLE RESULTS
Composite and Base Samples for STORY TP-1 through STORY TP-7

Test Pit (TP) Sample Number with Soil Classification	Location of Sample*	Sample Depth (FT)	Asbestos Soil Result	Visual Observation of Asbestos
19 STORY TP-1; Poorly graded dark brown silty sand with gravels	Pit Wall Composite	1.5 – 4*	ND**	Visual asbestos from 0-1.5'
20 STORY TP-1; Light Brown Clayey Silts w/no or very little gravels	Base	4.0	ND	No visual observation
21 STORY TP-2; Poorly graded dark brown silty sand with gravels	Pit Wall Composite	3.5 – 4	1 Structure (Chrysotile)	Visual asbestos from 0-3.5'
22 STORY TP-2; Light Brown Clayey Silts w/no or very little gravels	Base	4	ND	No visual asbestos
23 STORY TP-3; Poorly graded dark brown silty sand with gravels	Pit Wall Composite	1.5 – 3	ND	Visible asbestos from 0-1.5'
24 STORY TP-3; Light Brown sandy silt with gravels	Base	3	ND	No visible asbestos
26 STORY TP-4; Duff layer, sandy silt with 6" minus cobbles, dark brown silty sand, light brown sandy silt with gravels	Pit Wall Composite	0 – 3.0	ND	No visible asbestos
27 STORY TP-4; Light Brown sandy silt with gravels	Base	3	ND	No visible asbestos
28 STORY TP-5; Dark brown silty sand and 10-inch minus cobbles, light brown sandy silt with gravels	Pit Wall Composite	0 – 3.0	ND	No visible asbestos
29 STORY TP-5; Light Brown sandy silt with gravels	Base	3	ND	No visible asbestos
30 STORY TP-7; 1.5-inch minus road mix, 3-inch minus cobbles with dark brown clayey sand	Pit Wall Composite	0 – 3.0	ND	No visible asbestos
31 STORY TP-7; Light Brown sandy silt with gravels	Base	3	ND	No visible asbestos

*, When asbestos was present to the full depth of a test pit no composite sample was collected.
** ND = None Detected based upon 0.25% Target Analytical Sensitivity with CARB 435

4.3 ASBESTOS AIR-RELATED SAMPLING

Tetra Tech conducted both surficial dust sample collection and occupational air sample collection from December 17 to December 18, 2007, in accordance with referenced methodologies in Section 3.4. The following sections present air sampling results.

4.3.1 Asbestos Dust Sampling

Tetra Tech collected 14 separate dust sample cassettes from the lower level, main level, attic level, and third level of the NHB that represent 122 aliquot samples from porous, semi-porous, and non-porous surfaces. Two samples consisted only of one sample area per cassette primarily due to the fact that only one HVAC zone return air plenum exists in the third floor and only one return plenum of two possible plenums were accessible along the main floor. Appendix I contains Tetra Tech's asbestos dust sample field log notes from the horizontal dust surface collection process. Additionally, Appendix I provides detailed documentation as to the specific surface types [Non-Porous (NP), Semi-Porous (SP), or Porous (P)] for each separate aliquot sampling point as well as documentation of the different accessibility characteristics with respect to the order with which the aliquot points were sampled. Generally, the aliquot sampling order was followed to include a non-accessible area, infrequently accessed area, and accessible area for the first three aliquot sample points to preclude filter overloading past the

first three collected aliquots. However, sampling variability precluded this from occurring for every collected dust sample. **Figures 10 - 14** present sample point locations, order of aliquot samples, and porosity characteristics for both the NHB and SHB.

Dust sample analyses reported no samples with detectable concentrations of asbestos structures (**Table 6**), which indicates that asbestos has either been previously removed or was not transported into the NHB or SHB. The NHB was built in 1927 and the SHB was added in the early 1980s. Asbestos may have been used as fill material beneath the SHB; however, Tetra Tech's dust sampling did not indicate a detectable or quantifiable amount of asbestos in this building on the sampled horizontal surfaces. Historical documentation suggests that asbestos was stored in the NHB and may have been milled into commercial products in this structure; however, evaluation of dust sampling results did not indicate a detectable or quantifiable amount of asbestos in this structure on the sampled horizontal surfaces. Asbestos appears to have been used as fill material beneath the concrete dock along the northeast end of the NHB, which was added in the late 1970s. Asbestos may also have been used as fill material beneath stairway enclosures and/or docks along the north, east, and west sides of the NHB, as these structures were also added to the original building after construction. Appendix J provides laboratory analytical data for the dust samples.

Sample 31 was documented to have detectable asbestos structures of amosite and chrysotile at levels below the limit of detection for ASTM D 5755 - 03. These samples were analyzed using transmission electron microscopy (TEM). It is Tetra Tech's opinion that these structures may have come from interior building components or may have been brought into the building from exterior sources. Considering the age of the building and the fact that multiple pieces of furniture are purchased from a variety of locations, asbestos structures at these levels would be considered normal for such commercial structures.

TABLE 6
ASBESTOS DUST SAMPLE RESULTS
North & South Harrington Building

Sample ID with Area Sampled*	Area Sampled (cm^2)	Asbestos Type	Asbestos Structures
22 SHB – 1: Salvation Army Shop & Bathroom	1000	NA**	<3***
25 NHB – 1; Main Level SW Office and Men's/Women's Bathroom	1000	NA	<3
26 NHB – 2; Main level South Showroom/North Showroom w/closet	1000	NA	<3
27 NHB – 3; Main Floor entry hall, Main Office, Storage Rooms # 1 & 2	1000	NA	<3
28 NHB – 4; Main Level – East Dock Area	1000	NA	<3
29 NHB – 5; 3rd Level – Big Sky Aikido	1000	NA	<3
30 NHB – 6; Main Floor – Bitterroot Stained Glass: Shop and Storage	1000	NA	<3
31 NHB – 7; Lower Level – Basement Showroom	1000	Chrysotile, Amosite	<3
32 NHB – 8; Lower Level – Basement HVAC Room	1000	NA	<3
33 NHB – 9; Lower Level – Basement Shop, Office, Vault	1000	NA	<3
34 NHB – 10; Attic Level – South Showroom	1000	NA	<3
35 NHB – 11; Attic Level – North Showroom	1000	NA	<3
36 NHB – 12; Attic Level – Break room, East Office, Hallway	1000	NA	<3
37 NHB – 13; 3rd Floor – Big Sky Aikido HVAC Return Plenum	100	NA	<3
38 NHB – 14; Main Floor HVAC Return Plenum	100	NA	<3

* As included in Appendix A Figures –10 - 14
** NA = Not Applicable
*** < 3 = below the limit of detection for ASTM Method D5755-03 for asbestos counting criteria of 3:1 ratio

4.3.2 Asbestos Occupational Air Sampling

Tetra Tech collected two occupational air samples from Mr. Jeff Harrington on December 17 and 18, 2007, in accordance with the methodology referenced in Section 3.4. Throughout the course of each sampling event Tetra Tech monitored the air flow and sampling train to ensure that it was functioning at the desired calibrated flow rate with the attached equipment. Mr. Harrington's store opens for business at 0900 and closes at 1730 – 1800 Monday through Saturday.

On December 17, Mr. Harrington reported that the following tasks were performed throughout the course of his workday:

- 0950 – 1010: Working at desk in Main Level Front Office;
- 1010 – 1030: Steam cleaning in Lower Level Basement Shop Area;
- 1030 – 1230: Sales and assisting customers throughout Lower, Main, and Attic Level;
- 1230 – 1415: Furniture assembly in Main Level North Shop Area;
- 1415 – 1440: Sales in the Lower Level Basement Office and in Main Level North Dock;
- 1440 – 1530: Phone service and sales questions in Main level Front Office;
- 1530 – 1630: Furniture assembly in Main Level North Shop and Lower Level Basement Shop;
- 1630 – 1715: Sales and loading/unloading furniture in Attic South Shop, Main Level Shop area, Lower Level Shop area, and Main level North/West Loading Docks; and,
- 1715 – 1730: Sales at Main Level Front Office and Main Level Shop areas.

On December 18, Mr. Harrington reported that the following tasks were performed throughout the course of his workday:

- 0900 – 1015: Sales at Main Level Front Office;
- 1015 – 1045: Steam cleaning in Lower Level Basement Shop;
- 1045 – 1130: Sales calls and loading customers throughout Attic Level South Shop and Main Floor Shop;
- 1130 – 1140: Steam cleaning in Lower Level Basement Shop;
- 1140 – 1230: Assisting customers at Main Level North Loading Dock, Main Level Front Office, and Attic Level North/South Shop areas;
- 1230 – 1325: Furniture assembly in Attic Level South Shop area;
- 1325 – 1430: Sales in Attic Level South Shop area, Lower Level Basement Shop area, and Main Floor Shop area;
- 1430 – 1500: Stocking and furniture assembly in Main Floor Shop area; and,
- 1500 – 1621: Furniture assembly and loading at Main Floor Shop area and Main Floor North Dock.

None of the analyzed air samples indicated detectable concentrations of asbestos fibers using TEM. **Table 7** includes a summary of occupational air sample results. Appendix K contains the laboratory occupational air sample analytical results.

EPA's recommended framework titled *Framework for Investigating Asbestos-Contaminated Superfund Sites*, dated September 2008, describes the criteria used to assess risk to asbestos exposure for inhalable fibers with the following parameters:

- ELCR = excess lifetime cancer risk for less-than-lifetime scenario;
- EPC = the scenario-specific time exposure point concentration generated from activity-based sampling;
- TWF = the scenario-specific time weighting factor; and,
- IUR = the inhalation unit risk corresponding to the age at first exposure and exposure duration for the exposure scenario.

TABLE 7
ASBESTOS OCCUPATIONAL AIR SAMPLE RESULTS
December 17 – 18, 2007 NHB – Mr. Jeff Harrington

Sample ID with Date Sampled	Liters of Air Sampled	Asbestos Type	Asbestos Structures/cubic centimeters
45 Field Blank – (FB-1)	NA*	NA	NA
46 Media Blank-1	NA	NA	NA
47 Media Blank-2	NA	NA	NA
48 P-121707-01, December 17, 2007	932.6	1 Structure Anthophyllite	<0.00066**
49 P-121807-01, December 18, 2007	857.7	NA	<0.00112

* NA = Not Applicable
** ND = Non Detected with an analytical sensitivity of 0.22 structure/liter for sample ID 48-P-121707-01 and 0.38 structures/liter for sample ID 49-P-121807-01 in accordance with ISO Method 10312

Subsequently, the following evaluation of the "worst-case" exposure sample (Sample 48-P-121707-01) was used as the task-based sample of a general exposure for an individual that works or is a patron at the Harrington Attic and is exposed daily completing the above-referenced tasks:

- 1 structure of anthophyllite was identified with 932.6 liters of air sampled. This equates to 932,600 of cubic centimeters (cc) of air;
- The sample concentration is 1 structure/932,600 cc = 1×10^{-6} s/cc;
- 1×10^{-6} s/cc; TWF = (8 hours exposure estimated per day/24hours per day)*(250 days exposed per year/365 days in a year) = 0.228;
- IUR is based upon 25 years exposure starting at age 20;
- IUR = 0.066 s/cc (EPA,2008);
- ELCR = EPC * TWF*IUR
- ELCR = 1×10^{-8}.

The risk to employees and/or individuals that give patronage to Harrington's is less than DEQ's total excess cancer risk of 1×10^{-5} for carcinogens as noted in DEQ's Voluntary Cleanup and Redevelopment Act Application Guide (DEQ, 2002). The absence of asbestos fibers in the dust wipes and air samples collected suggests little risk of indoor asbestos concentrations at the facility.

4.4 QUALITY ASSURANCE

Tetra Tech collected quality control samples throughout the collection of environmental field samples to provide quality assurance and validity to the sampling results for the soil samples

collected from the test pits, dust samples collected from the interior of the NHB and SHB, and from the occupational air samples. Quality control samples consisted of field blanks, media blanks, and duplicate samples as required by the respective sampling methodologies and as documented in the SI Work Plan (Tetra Tech 2007a). Quality control sampling results are presented in **Table 8**. Appendix L contains laboratory analytical data for the QA sample results. Appendix M contains Tetra Tech's data validation reports for the soil, dust, and air samples collected during this SI.

TABLE 8
SOIL, DUST, and AIR QUALITY CONTROL SAMPLES

Matrix	Analytical Method	Type of Sample	Sample ID	Sample Result	No. of Collected Samples/ Method	SI Work Plan Requirement/ Sample Type
Soil	CARB 435 w/TEM 1000 Point Count	Duplicate	19-HEEBS-TP-4	ND* for Asbestos/ <0.1% asbestos	1	1
	CARB 435 w/PLM 400 Point Count	Duplicate	25-Story-TP-3	ND for Asbestos/ <0.25% asbestos	1	1
	CARB 435 w/PLM 400 Point Count	Duplicate	12-SHB-TP-2	ND for Asbestos/ <0.25% asbestos	1	1
	CARB 435 w/PLM 400 Point Count	Blank	MDT-111307-Q1	ND for Asbestos/ <0.25% asbestos	1	1
Dust	ASTM D5755-03 3:1 ratio	Field Blank	23-NHB-FB-1	ND for Asbestos/ < 3 Structures	2	2
			24-NHB-FB-2	ND for Asbestos/ < 3 Structures		
		Media Blank	20-NHB-Media Blank 1	ND for Asbestos/ < 3 Structures	2	2
			21-NHB-Media Blank 2	ND for Asbestos/ < 3 Structures		
Air	ISO Method10312	Field Blank	45-FB-1	ND for Asbestos/ < 23 structures/mm^2	1	1
		Media Blank	46-Media Blank-1	ND for Asbestos/ < 23 structures/mm^2	2	2
			47-Media Blank-2	ND for Asbestos/ < 23 structures/mm^2		

Procedures described in this section were designed to guide quality assurance. This section presents a discussion of the SI methods used to ensure data validity throughout the sample collection and analysis for this SI, including sample identification, chain-of custody, shipping, field blanks, method blanks, duplicates, and laboratory analytical methodology through the sampling design used to characterize the Facility.

4.4.1 Sampling Design

Section 2.2 of the SI Work Plan (Tetra Tech 2007a) details sampling protocols, including the types and numbers of samples, which were selected based on review of historic data and previous investigations completed at the Facility. The sampling design for the various media is described below.

4.4.1.1 Pavement Condition Evaluation

The visual assessment of pavement currently found in the SI Work Plan was used to characterize the degradation of current pavement conditions.

4.4.1.2 Asbestos Soil Sampling

Test pit asbestos soil sampling was used to estimate the quantity of asbestos impacted soil anthophyllite in soil present in the study area.

4.4.1.3 Asbestos Air Sampling (Interior Dust Samples)

Interior dust samples in the Harrington buildings evaluated whether anthophyllite structures exist along horizontal surfaces inside each of the buildings. Note that the North Harrington building has been documented to have stored asbestos and the South Harrington building has been documented as possibly having asbestos backfill material beneath the structure.

4.4.1.4 Asbestos Air Sampling (Interior Worker Task Sampling)

Interior worker task sampling evaluated whether if throughout the course of a work day, Harrington's Furniture employees are exposed to anthophyllite asbestos present in the air.

4.4.2 Measurement Data Acquisition

The type and quantity of samples, sample identification, sampling methods, sample handling, chain-of-custody procedures, and analytical methods required for field investigations at the Facility are described in Section 2.2 of the SI Work Plan (Tetra Tech, 2007a). These measurement data acquisition tools were used throughout the collection of data for this SI with only the following derivations: no soil samples were collected in test pit Story TP-6; and, no HVAC dust samples were collected from specific areas of the return plenum on the 3rd Level and Main Level of the NHB due to the HVAC ventilation system design. Sample No.'s NHB-7 and NHB-8 contain aliquots that represent the HVAC room, including horizontal areas in the return as noted in Appendix I. No data was collected from the negatively-pressurized return plenum in these spaces due to limitations on accessibility, however, other samples from the system are believed to be reflective of conditions. It should be noted that the HVAC system was installed during the renovation process after the Harrington family took over ownership of the building.

4.4.2.1 Field Quality Control Sampling

Soil Sampling

For the 17 composite samples collected from the side walls of the test pits, one duplicate sample for the complete side wall set was submitted to the laboratory for analysis. Additionally, one blank sample was submitted to the laboratory for the complete side wall assessment. The blank sample consisted of using soil that had previously been analytically tested for asbestos and was known not to contain asbestos. The purpose of the QA/QC sample collection is to ensure the laboratory does not enter sample contaminants into their sample handling procedures as well as to show that Tetra Tech does not enter contamination by route of sample handling into its sample collection process. Documentation of these blank samples increases the sample collection validity and accuracy for this SI.

For the 34 grab and composite samples collected, three duplicate samples were collected and submitted to the laboratory for analysis. One duplicate was from the set of composite test pit side wall samples, and two duplicates were from the set of test pit base samples. One of the duplicate samples (No. 19-Heebs-TP4) was reanalyzed to a higher level of sensitivity for additional confirmation of analytical results. Additionally, one blank sample was submitted to the laboratory.

Ten percent of soil samples collected were analyzed as specified above; but also analyzed using TEM, with the CARB 435 preparation method, to 0.10 percent.

Dust Sampling

Prior to the collection of the asbestos dust samples, two media blank samples from the lot of filter media cassettes were analyzed in accordance with sample methodology to ensure that these specific media were not contaminated with asbestos fibers. During collection of the dust samples, and in accordance with the method, Tetra Tech submitted one blank for 10 percent of the dust samples collected. This sample was collected by uncapping the filter cassette cap and allowing it to be exposed to building air for 30 seconds, thus acting as a field blank and providing sampler error information. None of the field or media blank cassettes contained a detectable concentration of asbestos fibers.

Air Sampling

One media blank sample and one field blank sample were submitted for analysis by ISO Method 10312 to meet a minimum suggested level of 20 percent for the laboratory samples submitted. Additionally, prior to the sampling and in accordance with ISO Method 10312, Tetra Tech submitted two cassettes from the lot of provided samples for TEM analysis to determine the mean asbestos structure count. If the mean count for all types of asbestos structures was found to be more than 10 structures/square millimeter, or if the mean fiber count for asbestos fibers and bundles longer than 5 microns was found to be more than 0.1 fibers per square millimeter, then the media lot would have been rejected. No asbestos fibers were detected on the media or field blank samples.

4.4.2.2 Laboratory Quality Control

EMSL Analytical, Inc., the laboratory chosen to analyze all asbestos samples, participates in the National Voluntary Laboratory Accreditation Program (NVLAP). Participation in this national program includes quarterly round-robin samples for analytical asbestos detection. These prepared samples include a known concentration of asbestos; when the laboratory performs analysis of these “spiked” samples their analysts must fall within the allowable standard deviation for the specific sample analyzed. Participation in this program ensures both precision and accuracy of both the equipment used in the analysis and the analyst's themselves. By subcontracting a laboratory participating in NVLAP, Tetra Tech ensured analytical results are both precise and accurate.

4.4.2.3 Equipment Operation and Calibration

All field and laboratory equipment was operated, maintained, and calibrated in accordance with applicable methodologies while using the manufacturer’s recommended procedures. Section 2.2 of the DEQ-approved SI Work Plan (Tetra Tech, 2007a) details the analytical methods,

which in turn specify the laboratory equipment operation, maintenance, and calibration procedures.

4.4.2.4 Data Management

The Tetra Tech project manager was responsible for ensuring that project personnel have the most current version of this SI and other project planning documents. The Tetra Tech project manager maintained project files and project documents in Tetra Tech's Great Falls then Helena, Montana, office.

Analytical laboratory data as well as pertinent field notes/data was directly downloaded onto the Great Falls server. During report generation and throughout the project, the Great Falls server was backed up daily to prevent loss of data.

The SI report includes field notes, field logs, field forms, chain-of-custody records, evaluation of data quality, and analytical reports. Tetra Tech's project manager performed internal quality assurance audits to ensure data collection and data management, including data review, verification, and validation were performed in accordance with the SI objectives.

5.0 RECOMMENDATIONS AND CONCLUSIONS

Tetra Tech performed a Supplemental Investigation at the CMC Bozeman Facility in December 2007 in accordance with Tetra Tech's SI Work Plan. The SI focused on previously uninvestigated areas where asbestos impacted soil may be located, an evaluation of pavement condition of areas known or suspected of containing asbestos, and, an investigation of potential airborne and settled dust concentrations of asbestos within the former ore storage/mill building and attached building addition. Our recommendations and conclusions are summarized below.

5.1 PAVEMENT ASSESSMENT

Using pavement assessment as a tool in the evaluation of the overall assessed area included in the Facility, our recommendations relative to pavement that may be covering asbestos are as follows:

- All areas of asphalt and Portland cement concrete rated High to Moderate for deterioration (**Figure 4**) should be replaced or repaired using similar construction materials;
- Contractors involved in pavement replacement or repair should be knowledgeable about the identification and hazards associated with asbestos and the Facility-specific asbestos, as included in an addendum to the 2002 VCP;
- All areas ranked as Low deterioration should be addressed using institutional controls and a City O&M Plan which would allow the City to inspect these areas for deterioration on a regular basis; and,
- The institutional control measures and O&M Plan should be incorporated into an addendum to the 2002 VCP.

These areas should be addressed as a preventative O&M measure and included in a preventative O&M program using a modified O&M approach as noted in EPA's "Purple Book," EPA Document No. 560/5-85-024 to prevent the release of asbestos fibers. Additionally, until all asbestos containing soils within South Wallace Avenue and the right-of-way have been replaced, a yearly pavement inspection of the entire South Wallace Avenue area included in this SI, should be included in the O&M program until replacement of all the included area occurs.

Due to the possibility that asbestos materials may be encountered in utility corridors during the excavation/utility repair work along South Wallace Avenue, Tetra Tech recommends addressing future work efforts in an addendum to the 2002 VCP to protect the health and safety of utility workers and the community.

5.2 SOIL

Based on Tetra Tech's analysis of the data collected during this investigation, it is Tetra Tech's opinion that the public has direct access to asbestos laden soils east of the SHB, south of the SHB along the Story Distributing Property, and in the alley behind Heeb's. Therefore, these areas should be remediated and/or addressed in accordance with an addendum to the 2002 VCP.

To prevent exposure to soils that contain visible asbestos along the eastside of the SHB, Story Distributing property, and Heeb's alley, Tetra Tech recommends that these asbestos

contaminated soils be excavated, transported, and disposed of by a contractor that has completed similar asbestos excavation remediation work, that employs DEQ-licensed Asbestos Contractor/Supervisors, and that employs 40-hr HAZWOPER OSHA trained individuals in accordance with all federal, state, and local regulations. Additionally, Tetra Tech recommends that all asbestos soils be removed in these areas to an over-excavation of approximately 0.5-feet to ensure that the soil contaminated with asbestos is removed. Confirmation samples should be collected to evaluate whether all of the asbestos materials have been removed. We estimate the following approximate soil volumes will require excavation and disposal; 104 yd^3 at the SHB, 101yd^3 at the Heeb's property, and 295 yd^3 at the Story Distributing Property; for a total of 500 cubic yards.

Tetra Tech recommends that specific areas where soils containing asbestos are known or likely to be present be addressed through an addendum to the 2002 VCP. An addendum to the 2002 VCP should evaluate the following:

- Excavation and/or encapsulation in the South Wallace Avenue utility corridor;
- Removal of asbestos contamination beneath South Wallace Avenue;
- Removal of asbestos contamination in areas adjacent to the SHB addition;
- Removal of accessible asbestos contamination on Story Distributing, Inc. property, EBM property, and, the alley south of Heeb's; and,
- Any required confirmation sampling.

The addendum should also address any remaining areas of contamination at the Facility through the analysis and selection of appropriate remedial alternatives. Those alternatives considered for selection should include no action, removal, and institutional controls (deed restrictions, City ordinance, etc.) for soils containing, or potentially containing asbestos, in the following inaccessible areas:

- Beneath buildings on the Harrington and Empire Building Materials property;
- South Wallace Avenue (between Main Street and Curtiss Street) and associated South Wallace Avenue right-of-ways and perpendicular street aprons (Babcock, Olive and Curtiss);
- Paved parking areas at Heeb's Grocery and the Harrington buildings;
- Loading docks, ramps and/or other structures on Empire Building Materials and Harrington properties; and,
- Sidewalks and other paved surfaces.

5.3 AIR AND DUST

Analysis of the dust and air samples did not indicate the presence of discernable quantities of asbestos surficial or airborne particulate inside the NHB or SHB; therefore these areas – in accordance with sampling methodologies as defined herein – should be considered free from quantifiable asbestos.

6.0 REFERENCES

Resource Technologies, Inc. (RTI) 2002a**.** Voluntary Cleanup Plan for the CMC East Main Depot Bozeman, Montana, Revision 2. Prepared for the City of Bozeman. October 2002.

_____2002b. Heath and Safety Plan for the CMC East Main Depot Site Voluntary Cleanup Bozeman, Montana. Prepared for the City of Bozeman. September 4, 2002.

_____2003. Addendum to the Voluntary Cleanup Plan for the CMC East Main Depot Facility, Bozeman, Montana. Prepared for the City of Bozeman.

_____2004, Voluntary Cleanup and Redevelopment Act Voluntary Cleanup Completion Report, Revision 1, CMC East Main Depot Site the Primary Portion of the CMC Asbestos Bozeman Facility Bozeman, Montana. Prepared for the City of Bozeman. August 2004.

Tetra Tech, Inc. 2007a. Final Revision – CMC Bozeman Facility Supplemental Investigation. Prepared for the City of Bozeman. November, 2007.

_____2007b. Limited Soil Investigation Results Report for the Nash-Finch/Bozeman Public Library. Prepared for the City of Bozeman. July 5, 2007.

_____2008. CMC Bozeman Facility: Revised Pavement Assessment. Prepared for the City of Bozeman. June 16, 2008.

APPENDIX A

Figures

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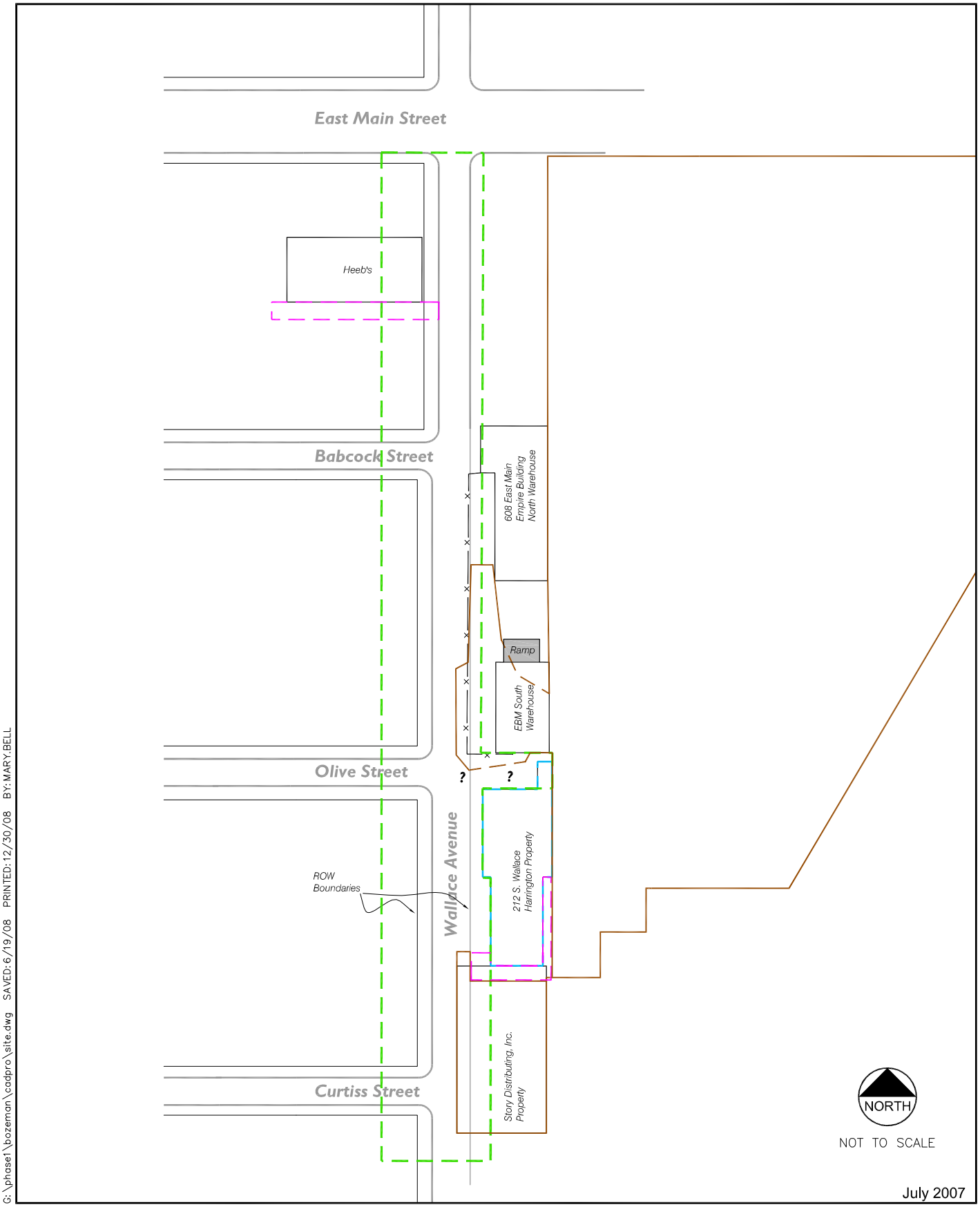
2005 Montana NAIP Aerial Photograph

Approximate Previously Assessed Area

Approximate Area Included in SI

7720035.200

CMC Bozeman Facility
Bozeman, Montana
Figure 1



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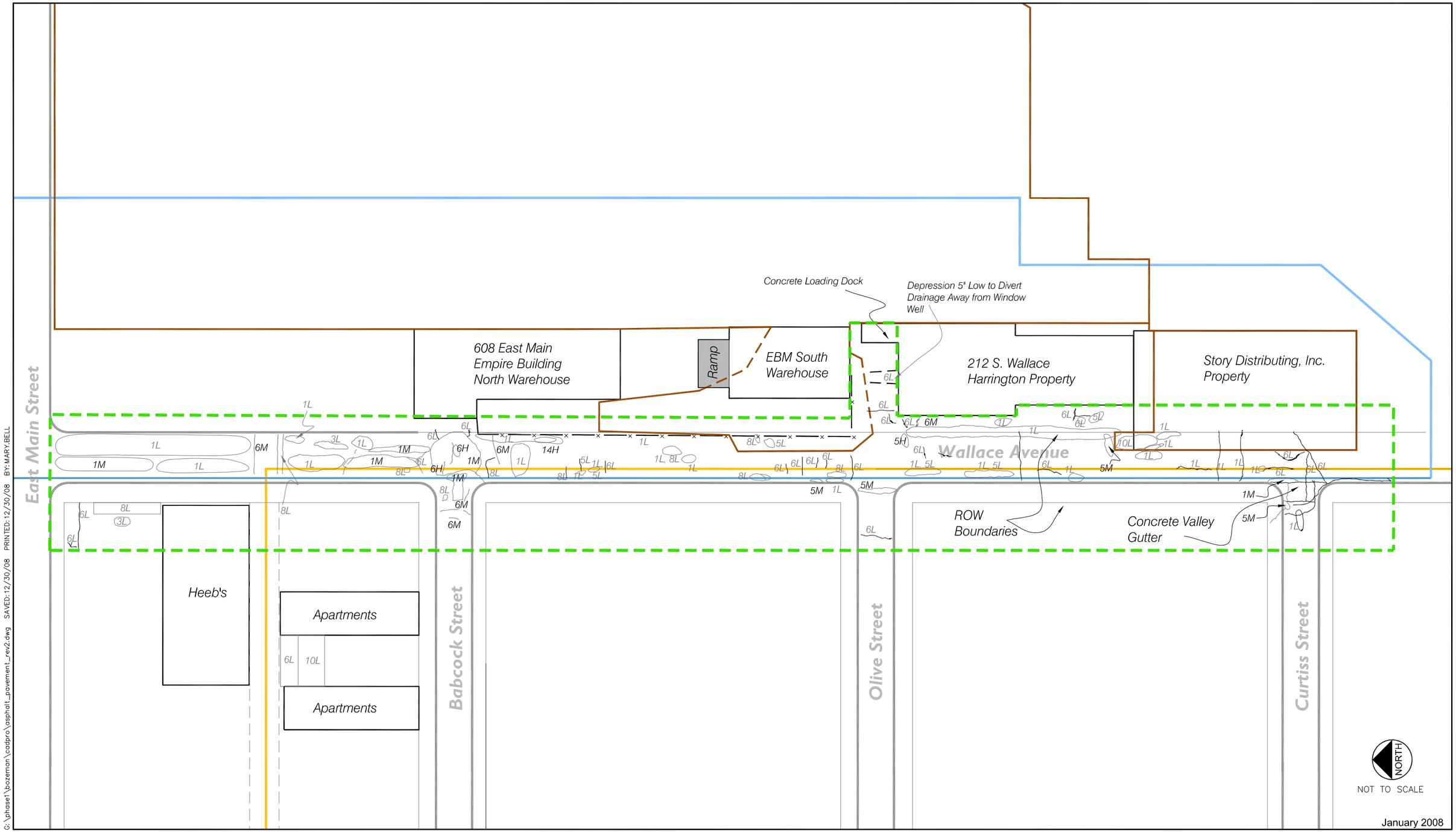
Interior Area included in SI
Exterior Area included in SI
Fence
Previously Assessed Area
Pavement Assessment Area

7720035.200

CMC Bozeman Facility
Bozeman, Montana
FIGURE 2



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7720035.200

- Previously Assessed Area
- Proposed Pavement Assessment Area
- Sewer Main - PVC Pipe
- Sewer Main - Clay Pipe
- Water Main - Cast Iron Pipe
- Water Main - Ductile Pipe

Asphalt Distress Type:

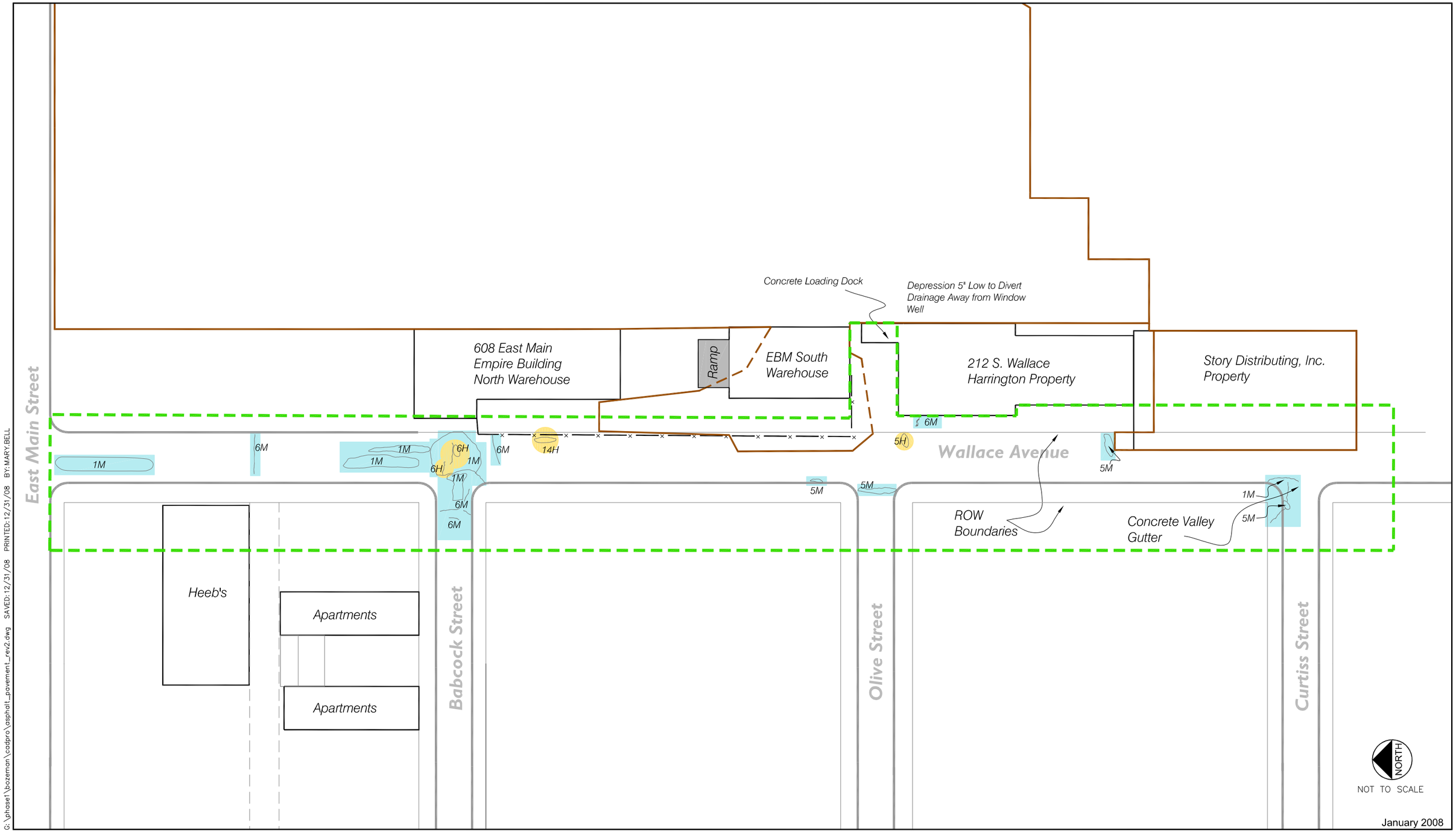
- **1** - Alligator Cracking
- **3** - Block Cracking
- **5** - Depression
- **6** - Longitudinal & Transverse Cracking
- **8** - Patching
- **14** - Swell
- **10** - Ravelling & Weathering

Severity Level:

- **L** - Low
- **M** - Medium
- **H** - High

Pavement Cracking

Asphalt Pavement Condition
Areas of Suspected Asbestos Ore
CMC Bozeman Facility
Bozeman, Montana
FIGURE 3



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7720035.200

Previously Assessed Area
Proposed Pavement Assessment Area
Asphalt to be Remove/Replaced
Asphalt to be Repaired

Asphalt Distress Type:

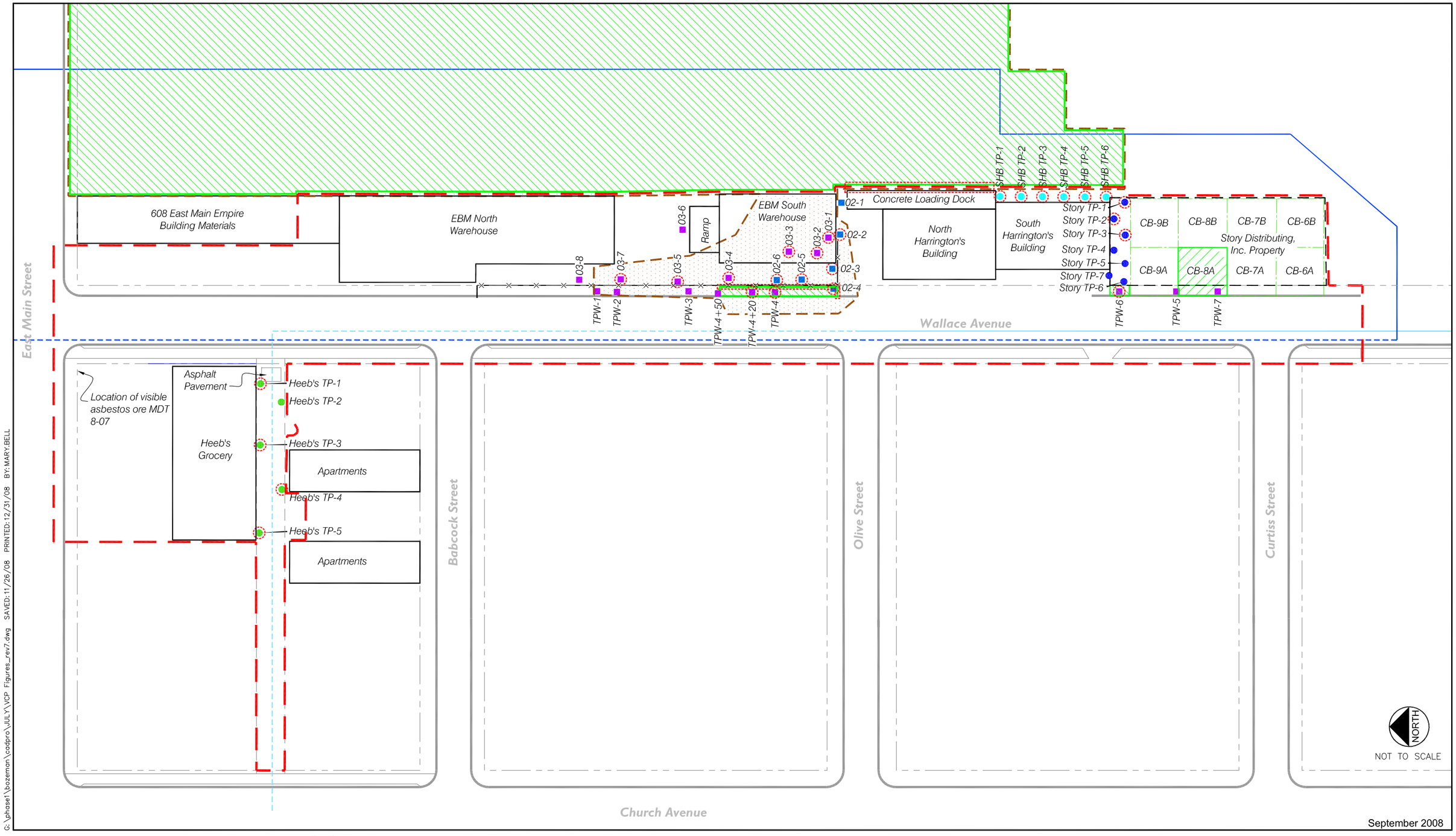
1 - Alligator Cracking
3 - Block Cracking
5 - Depression
6 - Longitudinal & Transverse Cracking
8 - Patching
14 - Swell
10 - Ravelling & Weathering

Severity Level:

M - Medium
H - High

Pavement Cracking

Asphalt Pavement Removal and Repair Recommendations
CMC Bozeman Facility
Bozeman, Montana
FIGURE 4



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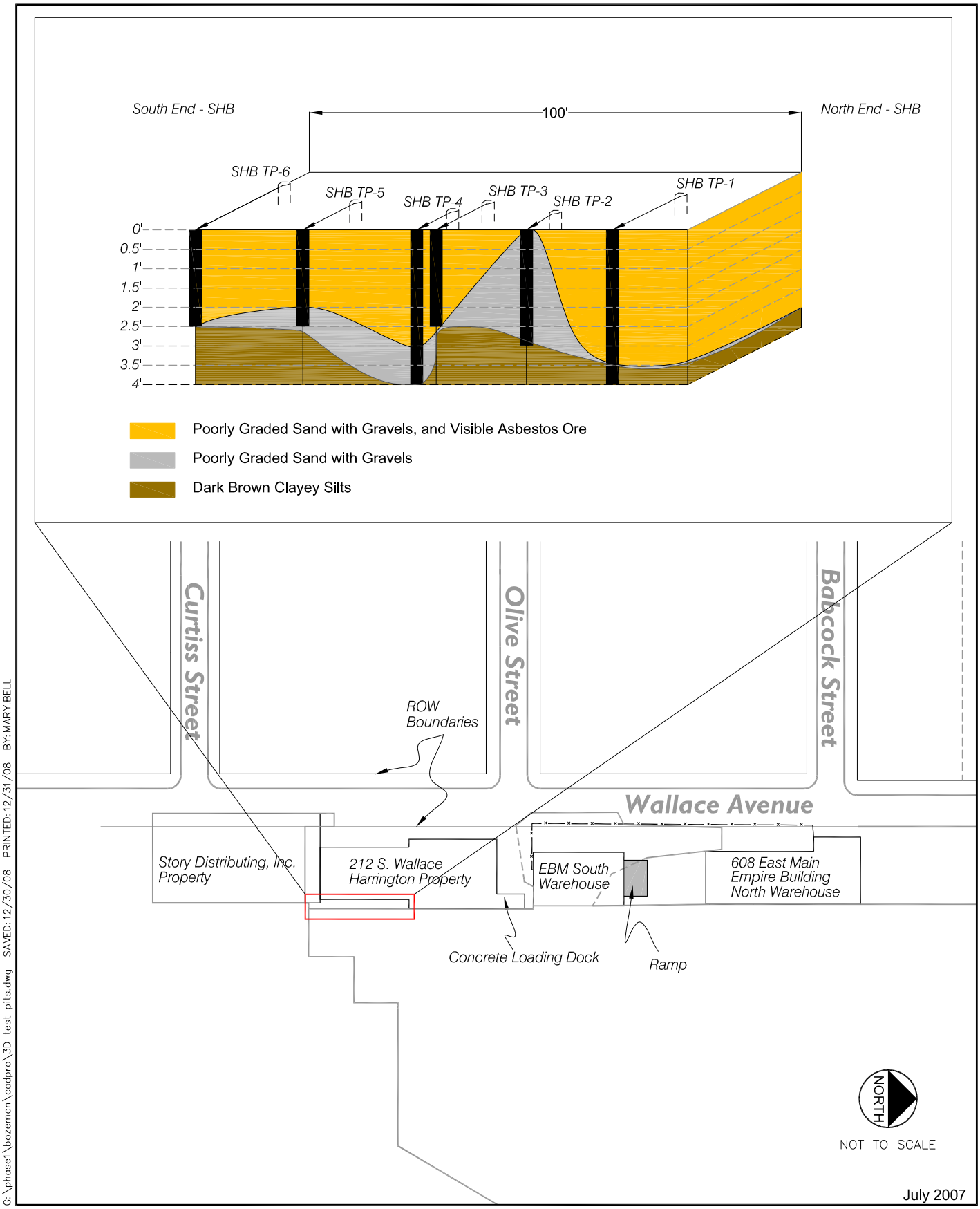
Facility
Previously Assessed Area (RTI 2002)
Right of Way Boundary
Sewer Main - Clay/PVC Pipe
Water Main - Cast Iron/Ductile Pipe
Previous Remediation Area (RTI 2003)
Visible Ore in Sidewall of Excavation (RTI 2003)

RTI Testpits 02 (RTI 2002)
RTI Testpits 03 (RTI 2003)
CB-## Story Distrubuting Test Pit Samples & Grid (Maxim 2005)
South Harrington Building Test Pit Samles (TetraTech 2008)
Story Distributing Property Test Pit Samples (TetraTech 2008)
Heeb's Alleyway Test Pit Samples (TetraTech 2008)
Visible Ore in Test Pit

7720035.200

Summary of All Investigation Data
CMC Bozeman Facility
Bozeman, Montana
FIGURE 5



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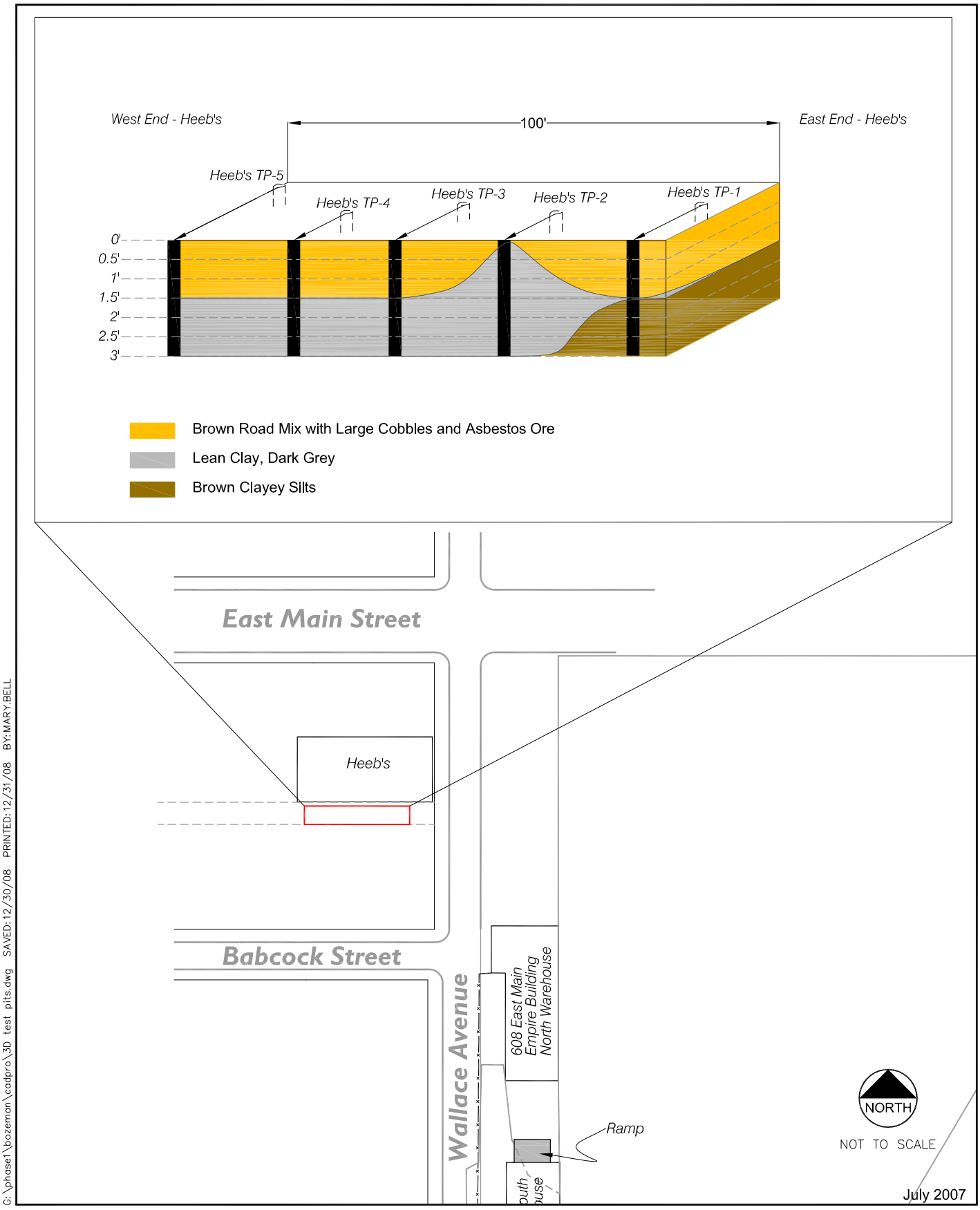
SI - SHB Assessment Area

7720035.200

SHB - Test Pit Diagram
CMC Bozeman Facility
Bozeman, Montana
FIGURE 6



SI - Heeb's Assessment Area

Heeb's - Test Pit Diagram
CMC Bozeman Facility
Bozeman, Montana
FIGURE 7

7720035.200

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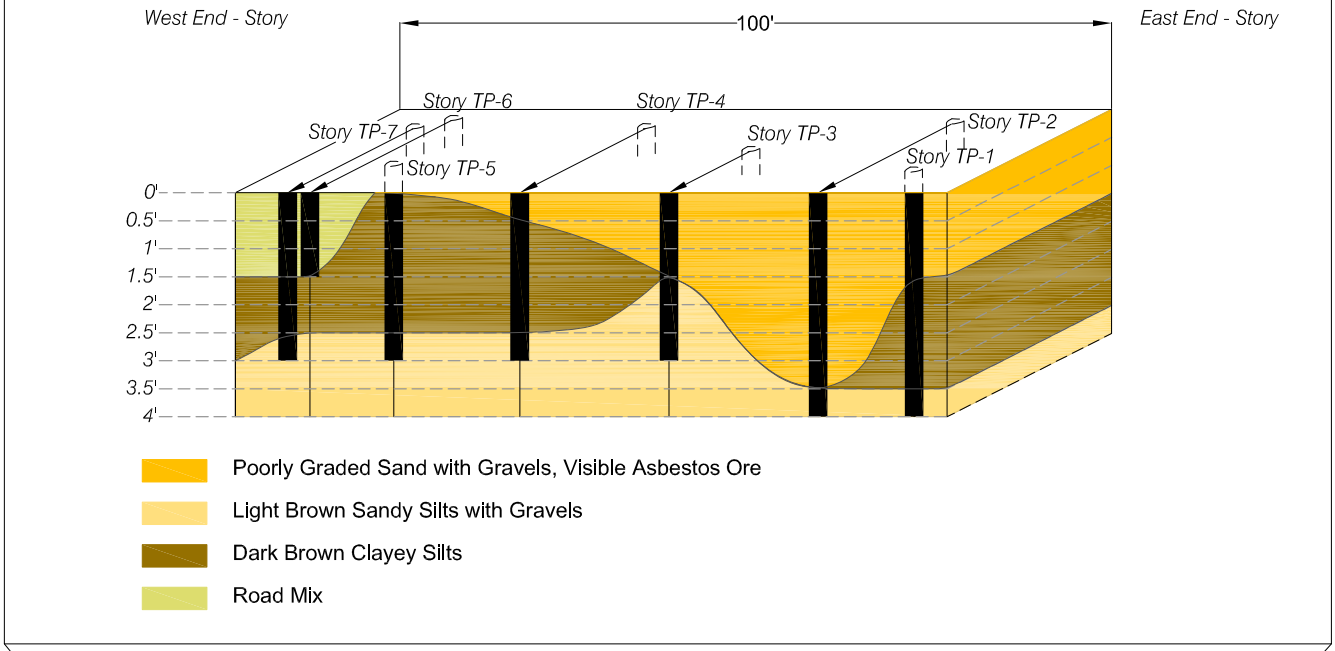

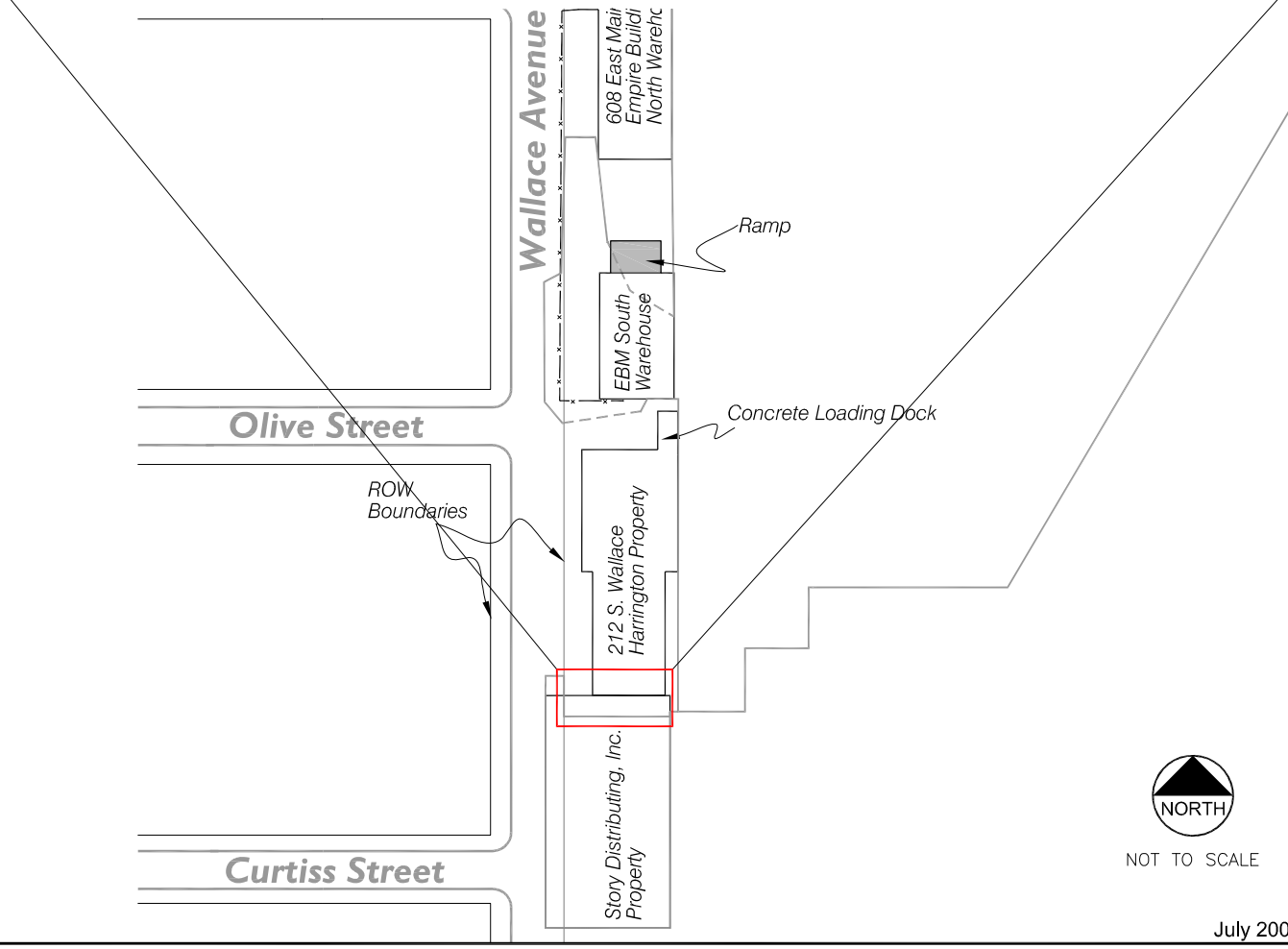

SI - Story Assessment Area

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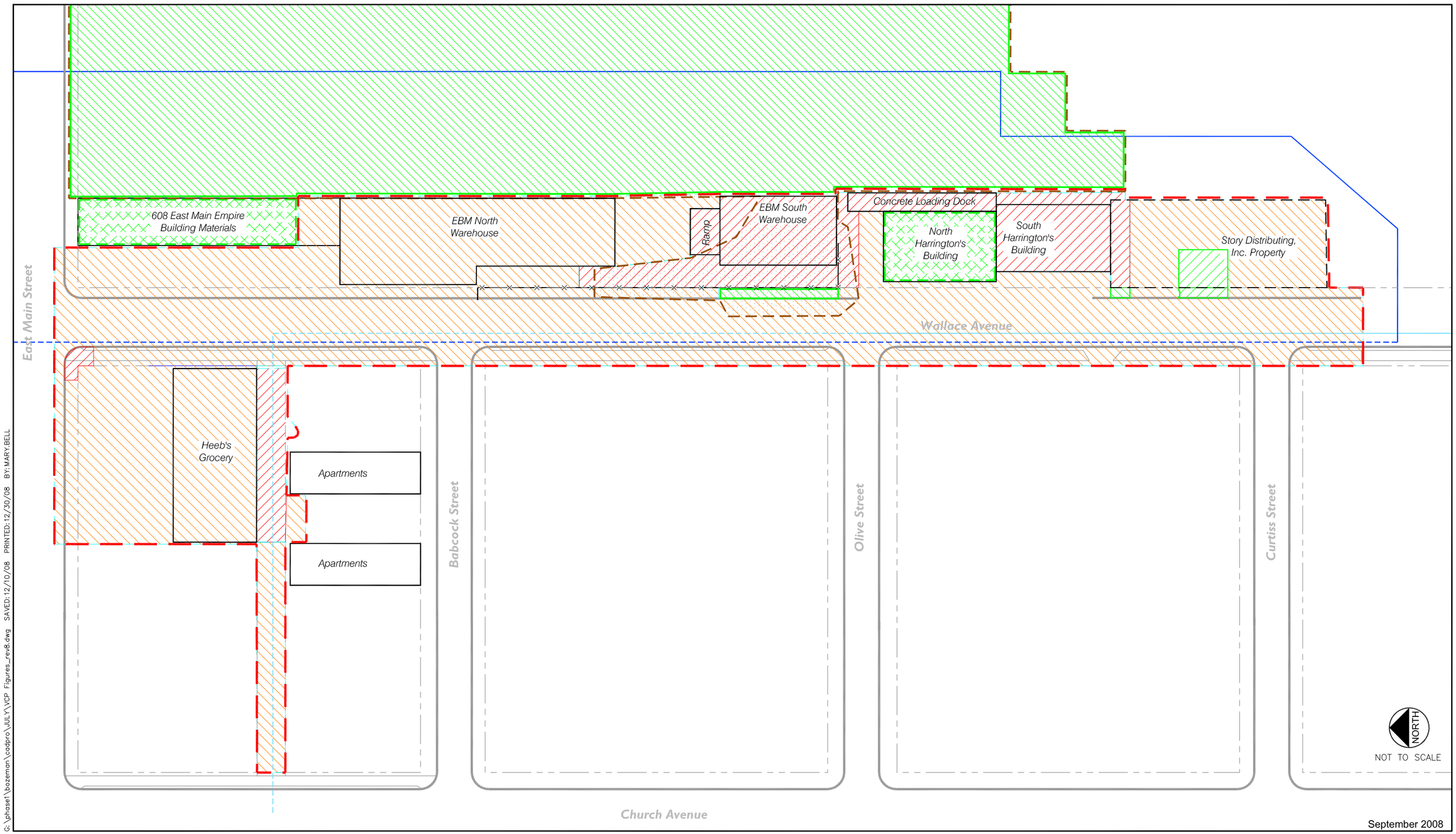
7720035.200

Story - Test Pit Diagram
CMC Bozeman Facility
Bozeman, Montana
FIGURE 8



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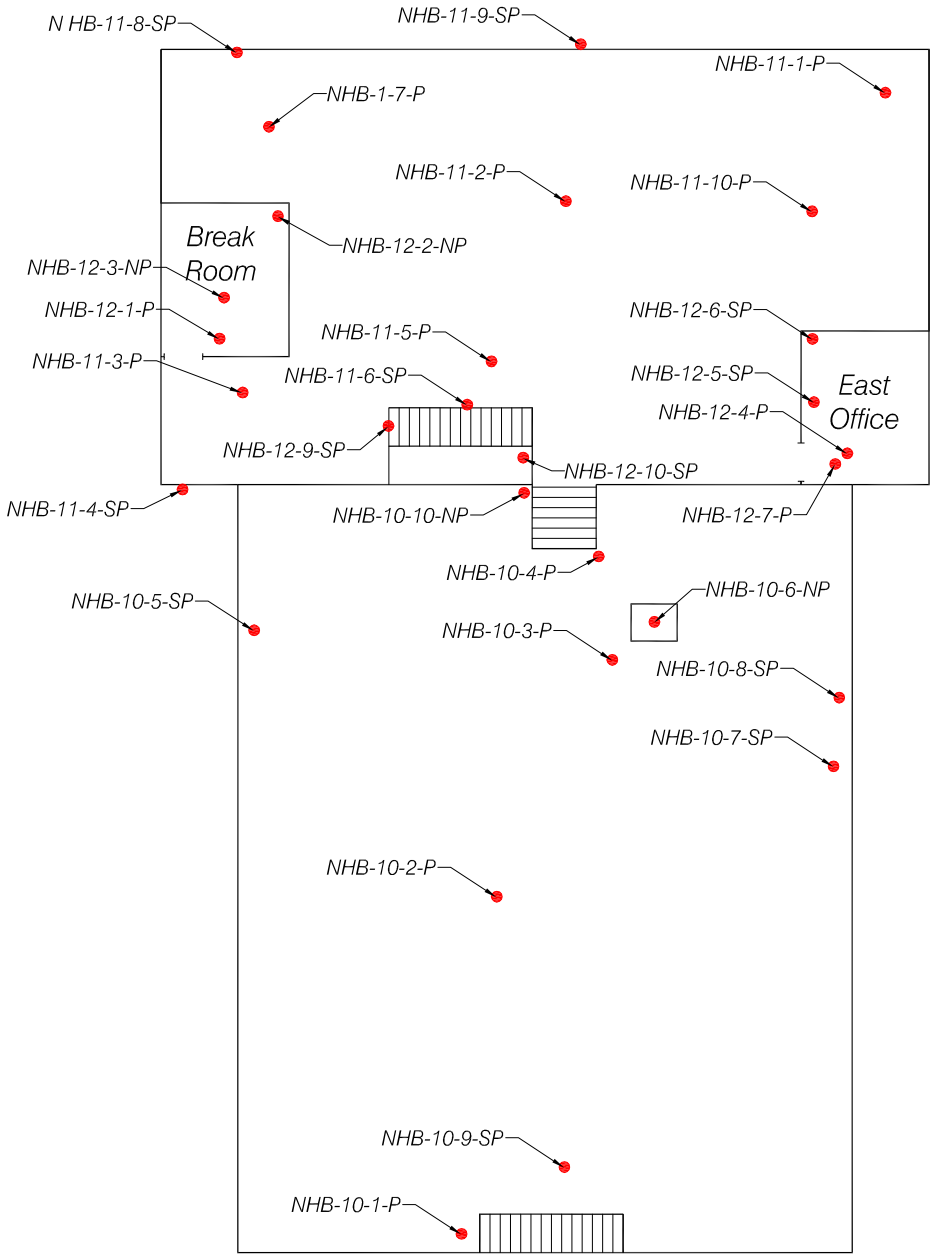
September 2008

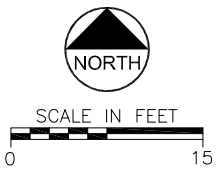
Facility
Previously Assessed Area (RTI 2002)
Right of Way Boundary
Sewer Main - PVC/Clay Pipe
Water Main - Cast Iron/Ductile Pipe

Observed Asbestos Ore Area
Potential Asbestos Ore Area
Potential No Asbestos Ore Area
Previously Remediation Area (RTI 2003)

7720035.300

Observed & Potential Asbestos Ore
CMC Bozeman Facility
Bozeman, Montana
FIGURE 9





October 2007

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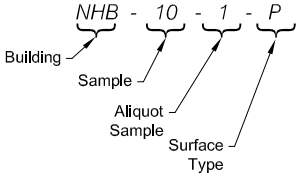
Legend

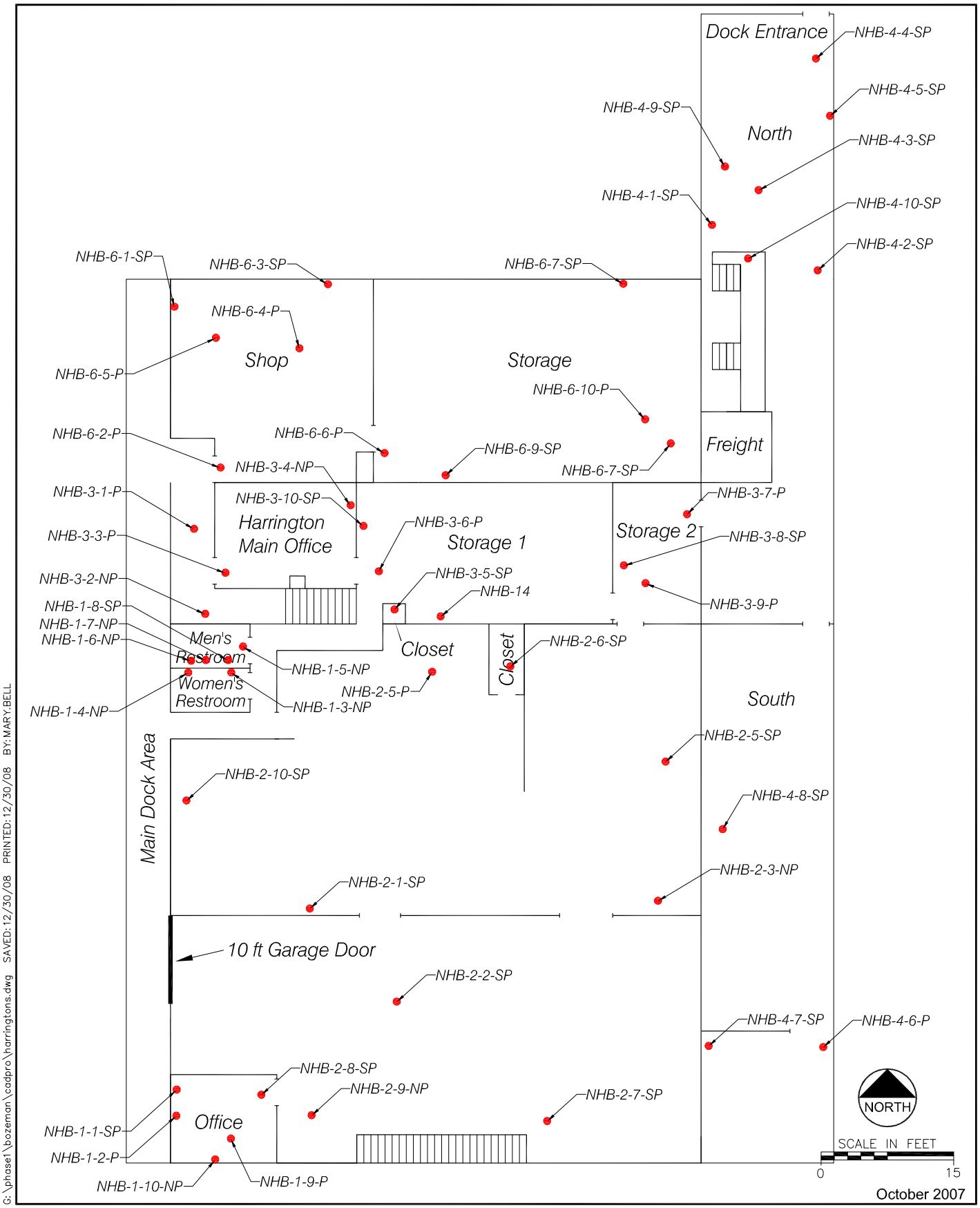


NHB North Harrington Building
SHB South Harrington Building

P Porous
NP Non-Porous
SP Semi-Porous

7720035.200

NHB - Attic Level
CMC Facility - SI
Bozeman, Montana
FIGURE 10



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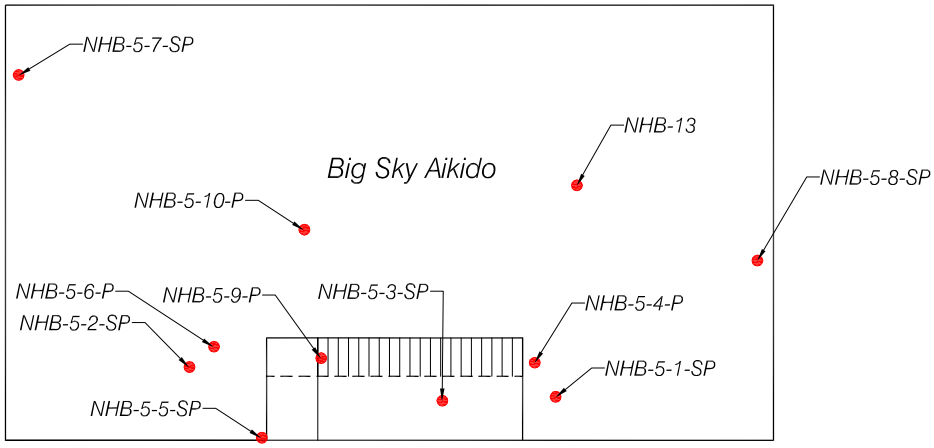
Legend

NHB - 10 - 1 - P
Building / Sample / Aliquot Sample / Surface Type

NHB	*North Harrington Building*
SHB	South Harrington Building
P	Porous
NP	Non-Porous
SP	Semi-Porous

7720035.200

NHB - Main Level
CMC Facility - SI
Bozeman, Montana
FIGURE 11



NORTH

SCALE IN FEET

0 15

October 2007

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Legend

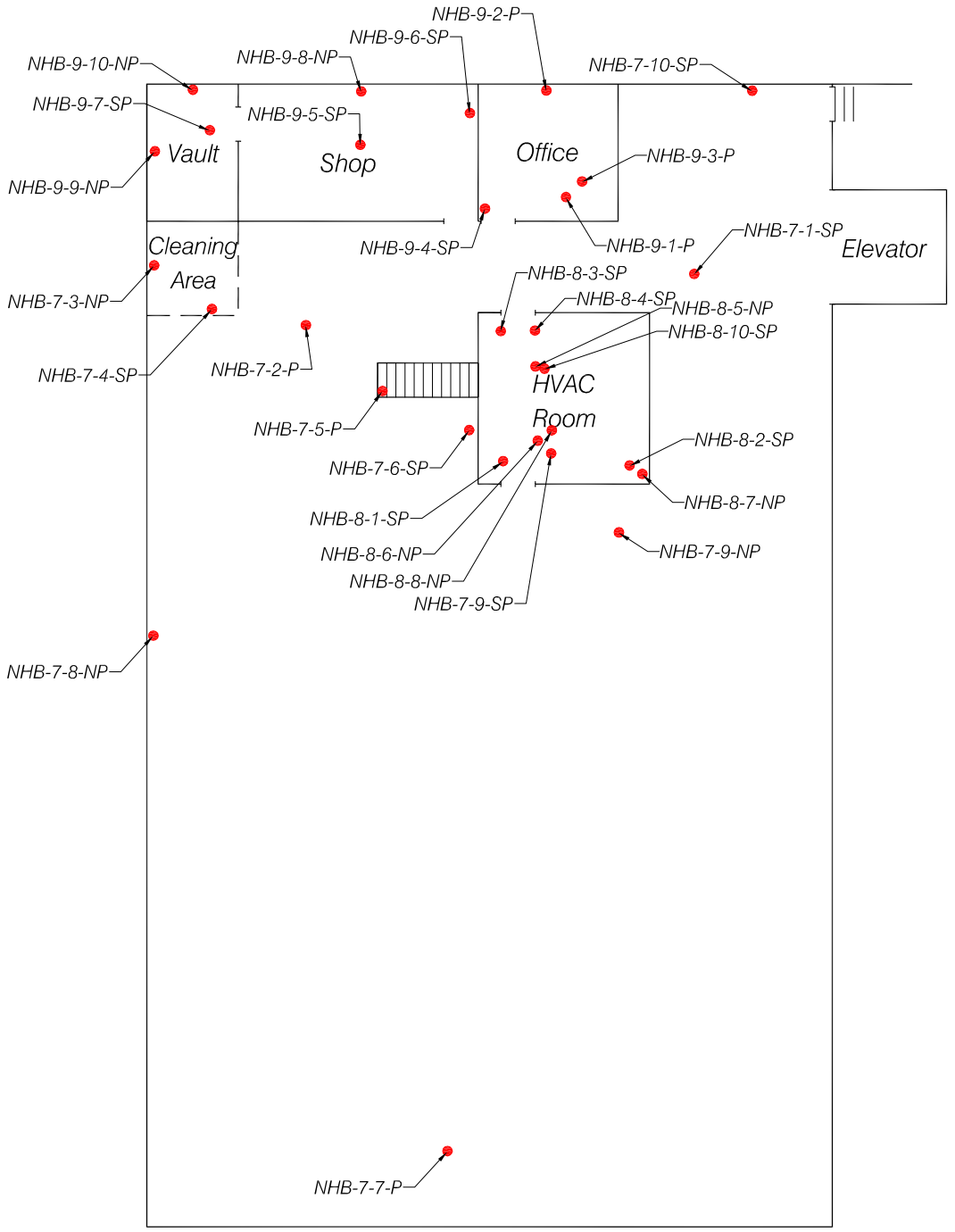
NHB - 10 - 1 - P

Building
Sample
Aliquot Sample
Surface Type

NHB	North Harrington Building
SHB	South Harrington Building
P	Porous
NP	Non-Porous
SP	Semi-Porous

7720035.200

NHB - Third Level
CMC Facility - SI
Bozeman, Montana
FIGURE 12



NORTH

SCALE IN FEET

0 15

October 2007

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Legend

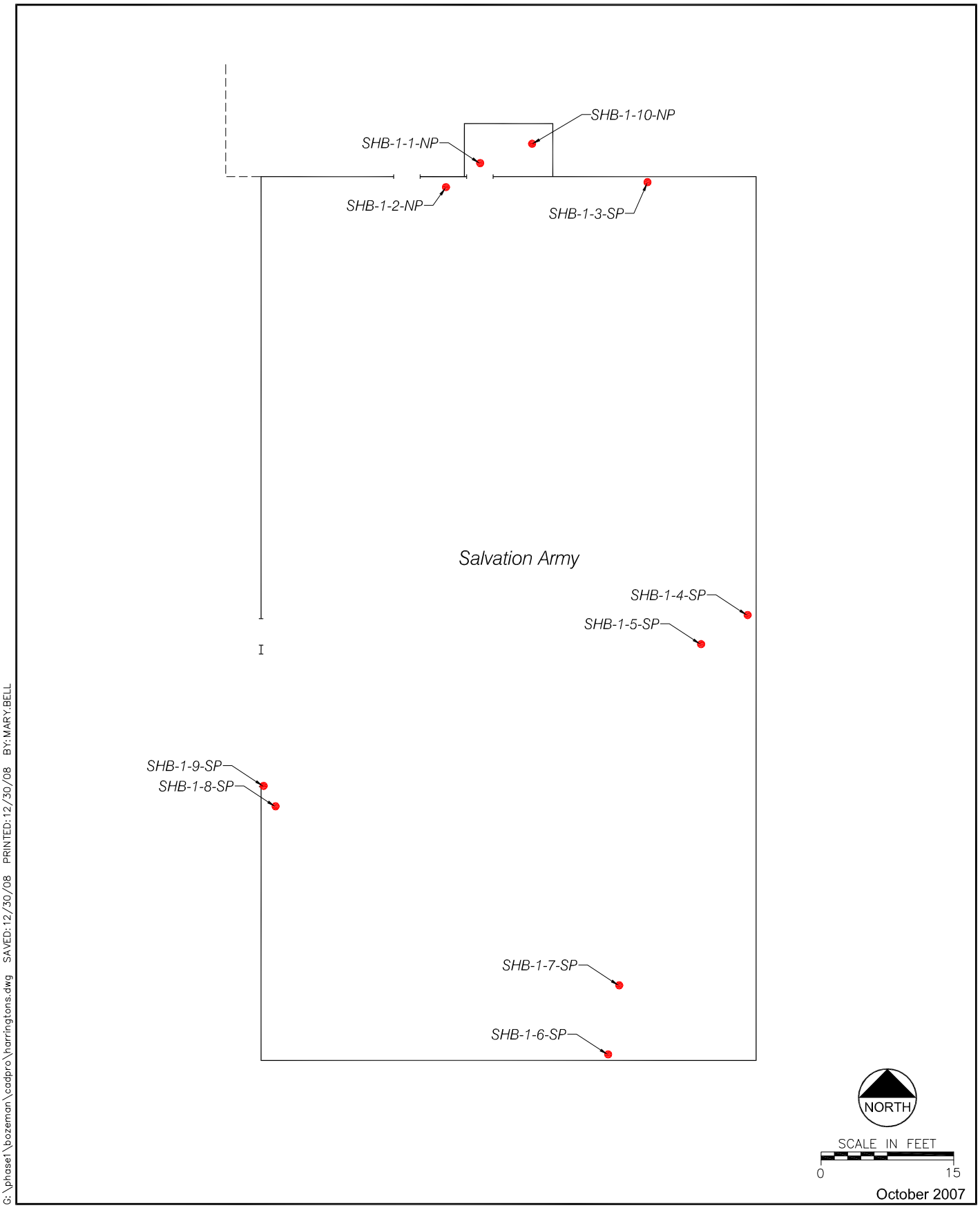
NHB - 10 - 1 - P

Building / Sample / Aliquot Sample / Surface Type

NHB	North Harrington Building
SHB	South Harrington Building
P	Porous
NP	Non-Porous
SP	Semi-Porous

7720035.200

NHB - Lower Level
CMC Facility - SI
Bozeman, Montana
FIGURE 13



October 2007

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Legend

NHB - 10 - 1 - P

Building
Sample
Aliquot Sample
Surface Type

NHB North Harrington Building
SHB South Harrington Building

P Porous
NP Non-Porous
SP Semi-Porous

7720035.200

SHB - Salvation Army
CMC Facility - SI
Bozeman, Montana
FIGURE 14

APPENDIX B

Site Specific CMC Bozeman Facility SI Work Plan - HASP

TETRA TECH

Safety Excellence

HEALTH AND SAFETY PLAN (HASP)

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Prepared By:	Scott Vosen Great Falls, Montana	**Date:**	December 14, 2007 Tetra Tech Project No.: 1157720035.200

Project Identification:

Service Type:	Industrial Hygiene	**Site Name:**	CMC Bozeman Facility
Client Name:	Montana Department of Transportation	**Site Location:**	Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street
Client Contact:	Mr. Tim Cooper	**Client Phone No:**	(406) 582-2303

Site History: Previous assessments have been completed for properties to the east of Wallace Avenue between East Main Street and Curtiss Street. Areas of known asbestos ore contamination in soil have been identified, and excavated in some areas, at the site.

Scope of Work: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

Site Regulatory Status:

CERCLA/SARA		RCRA		OSHA		OTHER FEDERAL	
US EPA:	No	US EPA:	No	1910:	Yes	DOE:	No
State:	Yes	state:	No	1926:	Yes	USATHAMA:	No
NPL site:	No	**NRC**		state:	Yes	Air Force:	No
		10CFR20:	No				

Review and Approval Documentation

Reviewed By:

A. Project Manager: Keith Cron Date: 12-17-07

B. Site H & S Coordinator: Nathan Shumate Date: 12.17.07

Approved By:

Date: 12-17-07

Approval signature also certifies that the PPE selected for this project was based on a hazard assessment and selected according to the requirements established by OSHA in 29 CFR 1910.132 (d).

Project Dates

Project Start Date: December 17, 2007

Project End Date: unknown

This site HASP must be reissued/reapproved for activities conducted after: December 31, 2008

Amendment Dates:

1

2

3

4

TETRA TECH
Safety Excellence

City of Bozeman - CMC Bozeman Facility
HEALTH AND SAFETY PLAN (HASP)

TABLE OF CONTENTS

Note: The sections highlighted in yellow are required for all health and safety plans with the other sections optional depending on the project, tasks and associated hazards. If this template is used for sites without chemical hazards, the following sections may be eliminated as well; H&S Evaluation Chemicals of Concern, Hazard Evalution of Chemicals of Concern and Precautions for Chemicals of Concern; and Decontamination Plan.

Forms Attached

Worker / Visitor Sign-In Form	√
Daily Tailgate Meeting Form	√
Field Audit Form	√

HEALTH AND SAFETY PLAN (HASP)

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Tetra Tech Representatives

Branch Address and Phone	Name/Title	Role and Responsibilities
Tetra Tech (406) 443-5210 303 Irene Street Helena, Montana 59601	Jess Whitford	Pavement Assessment
Tetra Tech (406) 453-1641 1601 2nd Avenue North, Suite 116 Great Falls, Montana	Keith Cron Nathan Shumate	Project Management & Oversight Site Characterization

Tetra Tech Subcontractors

Organization/Address and Phone	Name/Title	Role and Responsibilities
Abatement Contractors of Montana 406-549-8489 861 Dakota Ave. Missoula, MT 59802	Mike Foust	Test pit excavation
Scope of Work	Excavate test pits at the direction of Tetra Tech.	

Organization/Address and Phone	Name/Title	Role and Responsibilities
Scope of Work		

Organization/Address and Phone	Name/Title	Role and Responsibilities
Scope of Work		

Client / Tetra Tech / Subcontractor H&S Program & Policy Bridging Section

Identify which specific H&S programs will be followed for the designated scope of work.

H&S Program	Specify Program To Be Used	Comments
Emergency Evacuation Procedures	☐ Client X Tetra Tech ☐ Sub ☐ Other	Evacuation routes will be established by Tetra Tech's site health and safety coordinator during daily safety meetings.
Drilling and subsurface structure locates	Heas 7443900 ☐ Client X Tetra Tech ☐ Sub ☐ Other Hamiltons 7443904	Tetra Tech will submit a request to the UULC for location and surface-marking of underground utilities.
Permit Required Confined Space Entry	☐ Client ☐ Tetra Tech ☐ Sub ☐ Other	Not applicable; no confined space entries will be performed during this proejct.
Lockout / Tagout	☐ Client ☐ Tetra Tech ☐ Sub ☐ Other	Not applicable
Other	☐ Client ☐ Tetra Tech ☐ Sub ☐ Other	
Other	☐ Client ☐ Tetra Tech ☐ Sub ☐ Other	
Other	☐ Client ☐ Tetra Tech ☐ Sub ☐ Other	
Other	☐ Client ☐ Tetra Tech ☐ Sub ☐ Other	

Tetra Tech's policy is to provide a safe working environment for all employees and contractors so that work may be conducted in a safe and efficient manner.

Tetra Tech employees and subcontractor employees working at the specific project covered by this HASP shall adopt and adhere to this HASP and the above referenced programs/policies by following all requirements stated in the safe work practices applicable to their work. No work is so urgent or important that we cannot take the time to do it safely. **ALL** personnel on site including subcontractor's have the right and responsibility to stop the work if they feel a safety protocol is not being followed or if they feel an unsafe condition exists.

Nathan Shumate has been designated **Site Health and Safety Coordinator (SHSC)** for activities to be conducted at this site. The SHSC has total responsibility for ensuring that the provisions of this HASP are adequate and implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as SHSCs are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.

Keith Cron has (have) been designated as the **alternate SHSC(s)**.

HEALTH AND SAFETY PLAN (HASP)

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Activities Covered Under This Plan

Task	**1**	**Schedule:** December 17, 2007 - ??
Pavement Assessment		Tetra Tech will visually assess the condition of paving throughout the project corridor.
Task	**2**	**Schedule:** December 17, 2007 - ?? 12/19/07 –
Exterior Asbestos-in-Soi Assessment		Tetra Tech will visually assess soil for the presence of asbestos ore. Assessment locations will coincide with test pit locations. Test pits will be excavated with a backhoe and visually assessed to determine vertical extent of asbestos contamination. Soil samples will be collected at six-inch intervals to depth in each test pit location. Test pits will be excavated south of Heeb's Market and south and east of the Harrington building. Based on previous data collected at and proximate to the site, Tetra Tech anticipates the excavations will not exceed 4 feet in depth.
Task	**3**	**Schedule:** December 17, 2007 - ??
Indoor Asbestos-in-Air Assessment		The interior of the Harrington building will be assessed for the presence of asbestos. This task will include horizontal surface dust sampling with a microvac aparatus and personal air monitoring of Harrington and/or Tetra Tech employees during typical daily activities for Harrington employees.
Task	**4**	**Schedule:**

Types and Sources of Hazards

Physiochemical		Radiation		Chemically Toxic	
Flammable:	No	**Ionizing:**	No	**Inhalation:**	No
Explosive:	No	**Non-Ionizing:**	No	**Ingestion:**	No
Corrosive:	No	**Other**		**Absorption:**	No
Reactive:	No	**Physical Hazards:**	Yes	**Carcinogen:**	No
O2 Rich:	No	**Construction Activities:**	Yes	**Mutagen:**	No
O2 Deficient:	No			**Teratogen:**	No
Biological				**OSHA listed:**	No
Etiological Agent:	No	**Specific OSHA Standards:**	29 CFR 1910.120, 29 CFR 1910.132, 29 CFR 1910.134		
Other:	No		29 CFR 1926.1101		
(plant, insect, animal)					

Direct Sources of Hazards				Indirect Sources (Describe)
Air:	Yes	**Other:**	Dust	NA
Groundwater:	No			
Soil:	Yes			
Surface Water:	No			

Health and Safety Evaluation - Chemicals of Concern				
Chemical Name	**Entry Route**	**Carc***	**Symptoms**	**Target Organs**

Health and Safety Evaluation - Hazard Evaluation of Chemicals of Concern					
Chemical Name	**LEL/UEL (%)**	**Flam**	OT (ppm)	**IDLH**	**Exposure Limits**

Health and Safety Evaluation - Chemicals of Concern / Precautions

PRECAUTIONS

INGESTION: All listed chemicals have the potential for accidental ingestion, however in work place settings it is not considered a primary route of entry. All accidental ingestions should be addressed by referring to the MSDS and seeking immediate medical attention.

INHALATION: Listed chemicals capable of inhalation routes of entry should be maintained below the established exposure limits. If there is indication that the exposure limits are being exceeded, appropriate respiratory protection should be used. If appropriate PPE has not been planned for, work should cease and the SHSC should be contacted.

ABSORBANCE/CONTACT: Listed chemicals presenting an absorbance or contact hazards should be handled only with the use of appropriate PPE.

NOTE: Overexposure to any chemical via any route of entry should be addressed by referring to the MSDS and seeking immediate medical attention. Avoid contact with all chemical hazards when possible and consult MSDS before any exposure may occur.

OTHER PRECAUTIONS

There are no chemicals of concern associated with the tasks listed above.

ABBREVIATIONS

LEL= Lower Explosive Limit

UEL = Upper Explosive Limit

ppm = parts per million

mg/m3 = milligram per cubic meter

TWA = Time Weighted Average

STEL = Short Term Exposure Limit

Flam = Flammable

IDLH = Immediately Dangerous to Life and Health

OT = Odor Threshold

NOTE: Odor Thresholds were obtained from the American Industrial Hygiene Association's (AIHA) publication on Odor Thresholds. The listed thresholds are best estimates based on existing experimental data. (d) indicates the threshold for detection and (r) indicates the threshold for recognition.

NOTE: * In 1989, OSHA published new exposure limits (in most cases lower) for some chemical compounds. However, in 1993, under a court decision, these newly established limits were vacated and reverted back to the previous limit or to none if a limit was not previously established for the chemical compound. The limits listed in the table are the older, enforceable OSHA limits. It is recommended that the most conservative exposure limit listed be used in assessing exposures and determining controls and safety measures.

Health and Safety Evaluation - Physical / Construction Hazards of Concern

For the hazards that apply to this site, indicate the task(s) to which each particular hazard applies. For the hazards that do not apply to this site, delete the "1" in the Task No(s) column.

HAZARD	Task No(s)	Protection Procedure
Noise	All	Hearing protection should be worn if potential of >85 dB
Cold	All	Warm clothing; if symptoms develop - go to warm area
Rain	All	Wear rain gear; watch footing on wet surfaces
Snow	All	Warm clothing - watch footing on slippery surfaces
Electrical Storms	1,2	Discontinue operations
Confined Space Entry	2,3	Follow confined space permitting and entry procedures
Heavy Lifting / Moving	2,3	Utilize proper lifting techniques
Rough Terrain	1,2	Watch footing
Housekeeping	2,3	Maintain order
Neighborhood	All	Awareness of area; comply with contingency / ER plans
Traffic	1,2	Obey all traffic regulations; maintain awareness
Heavy Equipment Operation	2	Only qualified operators; inspections and back-up alarms
Lifting Equipment Operation	2	Only licensed operators; equipment inspections required
Excavating / Trenching	2	See Tt H&S Manual; Comply with OSHA regulations
Utilities - Underground	2	Have located before any work commences
Utilities - Overhead	2	Keep objects more than 20 feet from power lines
Electrical - General	2	See Tt H&S Manual; Comply with OSHA regulations
Hand Tools	All	Use appropriate tools for the task
High Pressure Water	2	Follow operating instructions
Other:		
Other:		
Other:		

Task Based Risk Analysis and Protection Plan

The preceding tables have identified the known and suspected hazards to be present in performing the tasks required to complete this project. Below is a breakdown by task of the hazards, likelihood of exposures, and protective protocols to be used to minimize risk.

Associated Hazards:	**CHEMICAL**	There are no anticipated chemical exposures associated with this task.
	PHYSICAL	Traffic, uneven terrain, slips/trips/falls, weather.
	BIOLOGICAL	There are no anticipated biological hazards associated with this task.
	OTHER	Asbestos fiber inhalation
Exposure Potential:	**CHEMICAL**	NA
	PHYSICAL	Likely
	BIOLOGICAL	NA
	OTHER	Not Likely
PPE:	Level D	PPE for this task should include long pant, leather boots, and appropriate clothing for weather conditions (e.g. gloves, coat, hat, rain gear, etc.).
Air Monitoring Plan	There are no air monitoring requirements associated with this task.	
Air Monitoring Equipment	NA	
Precautions:	**CHEMICAL**	NA
	PHYSICAL	Be mindful of traffic, use caution to avoid slip/trip/fall hazards (e.g. puddles, curbs, pot holes, ice, etc.), wear appropriate clothing for weather conditions.
	BIOLOGICAL	NA
	OTHER	Potential asbestos exposure is related to the nature of the project (i.e. potential asbestos ore contamination of soil). Avoid obvious asbestos ore contamination. If dry, windy conditions exist, avoid dust as appropriate (e.g. leave site, move upwind, etc.) until conditions become favorable.

Task Based Risk Analysis and Protection Plan

The preceding tables have identified the known and suspected hazards to be present in performing the tasks required to complete this project. Below is a breakdown by task of the hazards, likelihood of exposures, and protective protocols to be used to minimize risk.

TEST PITS

Associated Hazards:	**CHEMICAL**	There are no anticipated chemical exposures associated with this task.
	PHYSICAL	Heavy equipment (backhoe), excavation hazards (utilities, sidewall collapse, etc.), traffic, strains, slips/trips/falls, weather.
	BIOLOGICAL	There are no anticipated biological hazards associated with this task.
	OTHER	Asbestos fiber inhalation
Exposure Potential:	**CHEMICAL**	NA
	PHYSICAL	Likely
	BIOLOGICAL	NA
	OTHER	Somewhat likely
PPE:	Level C	PPE for this task should include steel-toe leather boots, long pants, hard hat, safety glasses, tyvek suits, air-purifying respirator (HEPA-filtered), and gloves (latex/nitrile and/or cloth/leater), as appropriate.
Air Monitoring Plan	Ambient, down-wind air monitoring will be conducted during test pit excavation activities. Sampling will be conducted in accordance with the NIOSH 7400 Method for PCM. One sample will be collected while workiing in each of the followign three areas (three total samples): 1) east of the Harrington building; 2) south of the Harrington building; and, 3) south of Heeb's Market.	
Air Monitoring Equipment	Vacuum pump, stand, PCM cassettes, and calibration device (primary or secondary).	
Precautions:	**CHEMICAL**	NA
	PHYSICAL	Use caution while near heavy equipment, maintain eye contact with operators, do not enter excavations greater than 4 feet deep without proper shoring and/or sloping (1:1), ensure underground utilities have been surface-marked prior to excavation, be mindful of traffic and use traffic control (e.g. signage, cones/candles, barricades) as appropriate, use proper lifting techniques (e.g. legs, not back, no twisting), use caution to avoid slips/trips/falls, wear proper clothing for weather conditions.
	BIOLOGICAL	NA
	OTHER	If asbestos ore is observed, don air-purifying respirator (HEPA-filtered). Properly decontaminate reusable equipment and supplies. Discard disposable equipment and supplies.

Task Based Risk Analysis and Protection Plan

The preceding tables have identified the known and suspected hazards to be present in performing the tasks required to complete this project. Below is a breakdown by task of the hazards, likelihood of exposures, and protective protocols to be used to minimize risk.

PERSONNEL MONITORING

Associated Hazards:	**CHEMICAL**	There are no anticipated chemical exposures associated with this task.
	PHYSICAL	Strains, slips/trips/falls
	BIOLOGICAL	There are no anticipated biological hazards associated with this task.
	OTHER	Asbestos fiber inhalation
Exposure Potential:	**CHEMICAL**	NA
	PHYSICAL	Somewhat likely
	BIOLOGICAL	NA
	OTHER	Unlikely
PPE:	Level D	PPE for this task should include long pants, leather boots, gloves (latex/nitrile or cloth/leather).
Air Monitoring Plan	JEFF HARRINGTON only	Personnel air monitoring will be performed on two indiviuals during this task (Harrington and/or Tetra Tech employees). Samples will consist of 8-hour TWA samples to be analyzed by the PCM method.
Air Monitoring Equipment		Low-flow, personal sampling pumps, PCM cassetts, and calibration standard (primary or secondary).
Precautions:	**CHEMICAL**	NA
	PHYSICAL	Use caution to avoid slips/trips/falls, use proper lifting techniques (legs not back, no twisting).
	BIOLOGICAL	NA
	OTHER	Avoid raising dust where possible. If conditions warrant, don half-face respirator (HEPA filtered) and/or cease work.

Task Based Risk Analysis and Protection Plan

The preceding tables have identified the known and suspected hazards to be present in performing the tasks required to complete this project. Below is a breakdown by task of the hazards, likelihood of exposures, and protective protocols to be used to minimize risk.

Associated Hazards:	CHEMICAL	
	PHYSICAL	
	BIOLOGICAL	
	OTHER	
Exposure Potential:	CHEMICAL	
	PHYSICAL	
	BIOLOGICAL	
	OTHER	
PPE:	Level	
Air Monitoring Plan		
Air Monitoring Equipment		
Precautions:	CHEMICAL	
	PHYSICAL	
	BIOLOGICAL	
	OTHER	

Personal Protective Equipment Level Definitions

Level D

Level D protection is assigned when minimal protection is warranted. Level D offers protection from nuisance contamination only and is made up of a typical work uniform for the work to be performed. Level D protection includes the following:

Hard hat, safety glasses, hearing protection (as required), gloves, and steel toe boots.

Level C

Level C protection is assigned when the type(s) and concentration(s) of contaminants is known and the criteria for using an air-purifying respirator are met. Level C is an upgrade from level D and in addition to the requirements of level D, the following requirements must be met:

Level D plus Full-face or half-mask air purifying canister/cartridge equipped respirator, hooded chemical resistant clothing, and inner and outer chemical resistant gloves.

Level B

Level B protection is assigned when the type(s) and concentration(s) of contaminants is unknown or is known and warrants the highest level of respiratory protection with a lesser level of skin protection. Level B is an upgrade from level C and in addition to level C requirements, the following requirements must be met:

Level C plus pressure-demand full-face SCBA or pressure demand supplied air respirator with escape SCBA.

Level A

Level A protection is assigned when the atmosphere is IDLH (Immediately Dangerous to Life and Health) and warrants the highest degree of respiratory protection and skin protection. Level A is and upgrade from level B and in addition to level B requirements, the following requirements must be met.

Level B plus totally encapsulating chemical-protective suit.

CARTRIDGE CHANGEOUT SCHEDULE

Cartridge Changeout Schedule: Cartridges will be changed per manufacturer recommendations or as loading occurs creating difficult breathing. Manufacturer recommends single use for disposible cartridges.

Method Used to Determine Schedule: Difficulty breathing through respirator. Adjusted based on activity and site conditions.

Decontamination Plan

Personal Decontamination

The section outlining task by task risk assessment and protection plan specifies the level of protection required for each task. Consistent with the level of protection required, step by step procedures for decontamination for each level of protection are given below.

Disposable PPE (e.g. tyvek suites, latex/nitrile gloves) will be removed following completion of each test pit excavation. Reusable equipment will be decontaminated with water following each test pit excavation. Emplyees will self-decontaminate.

Levels of Protection Required for Decontamination Personnel

The level of protection required for a person assisting with decontamination is:

LEVEL: D

Modification: (upgrade or downgrade) will be made under the following conditions:

No decontamination personnel will be utilized for this project.

Disposition of Contaminated Wastes

The following outlines the protocol to be followed for contaminated wastes that are encountered:

Anticipated contaiminated wastes will be limited to asbestos ore impacted soils and dust. Impacted soil and asbestos ore will be returned to the test pit excavations from which they originated. Decontamination fluids will also be disposed in the test pit excavations.

Sampling Equipment Decontamination

The following outlines the protocol to be followed for decontamination of sampling equipment:

Sampling equipment will be decontaminated with water; water will be disposed in test pit excavations.

Non-Sampling Equipment Decontamination

The following outlines the protocol to be followed for decontamination of non-sampling equipment:

Equipment will be decontaminated with water; water will be disposed in the test pit excavations.

Contingencies

Emergency Contacts and Phone Numbers

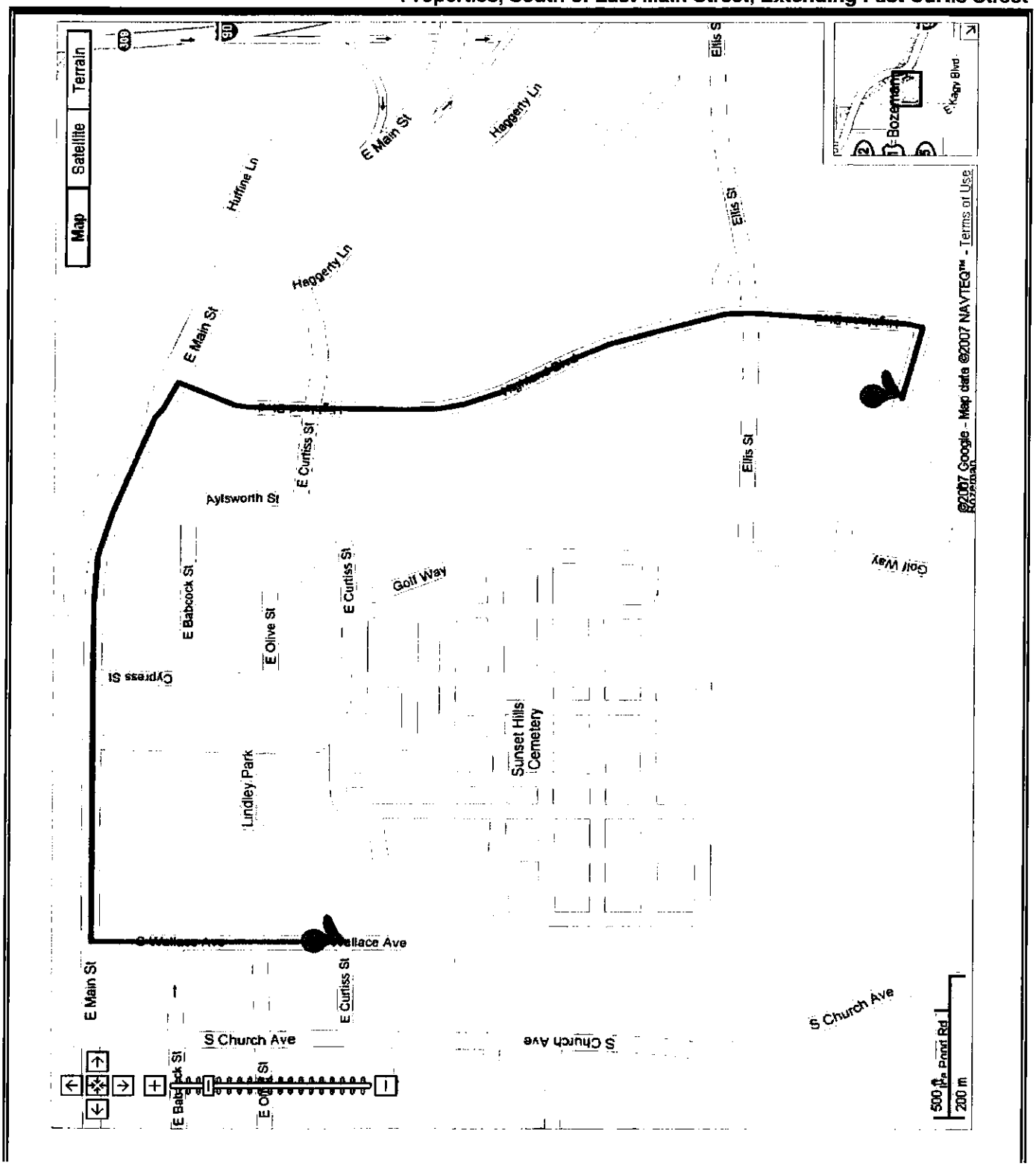
Agency		Contact	Phone Number
Tt Emergency Contact for the Project		Keith Cron	(406) 788-5318 cell
24 Ambulance Service		911	911
Fire Department		Local	911
Police Department		Local	911
Onsite Coordinator		Keith Cron	406-788-5318
Site Telephone		Mobile	406-788-5318
Nearest Telephone			
In the event of an incident, the TT-MM reporting protocol requires that a corporate contact be notified as soon as possible.	**Yvonne Freix**	**Office:** 715-845-4100 **Mobile:** 800-976-2524 **Home:** 715-355-4193	
	Stacy Meacham	**Office:** 402-933-1345 **Mobile:** 402-651-6675 **Home:** 402-933-7763	
	Anita Carrico	**Office:** 214-953-3111 (285) **Mobile:** 469-585-8931	
	Tory Fravel	**Office:** 970-223-9600 **Mobile:** 970-481-0883 **Home:** 970-266-9409	

Local Medical Emergency Facility(s)

Name of Hospital:	Bozeman Deconess Hospital	**Distance:**	1.4 miles
Address:	915 Highland Blvd	**Time:**	5 minutes
Type of Service:	ER, 24 hr, trauma, burn center, chemical exposures etc.		

Route: SEE ATTACHED DIAGRAM Head north on South Wallace Avenue, toward East Olive Street (0.2 miles); Turn right at East Main Street (0.5 miles); Turn right at Highland Boulevard (0.6 miles); Turn right (338 ft).

In the case of a **SERIOUS OR LIFE-THREATENING EVENT** (any injury, accident or near-miss event):
1. Seek emergency medical treatment immediately
2. Once the injured person(s) is appropriately cared for, call a corporate contact listed on the emergency wallet card and update the employee's supervisor and project manager as soon as possible.


Map
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Happerty Ln
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Ellis St
E Curtiss St
Aylsworth St
E Babcock St
E Olive St
Golf Way
Cypress St
Lindley Park
Sunset Hills Cemetery
E Wallace Ave
S Church Ave
Bozeman
Kagy Blvd
©2007 Google - Map data ©2007 NAVTEQ™ - Terms of Use
500 ft
200 m

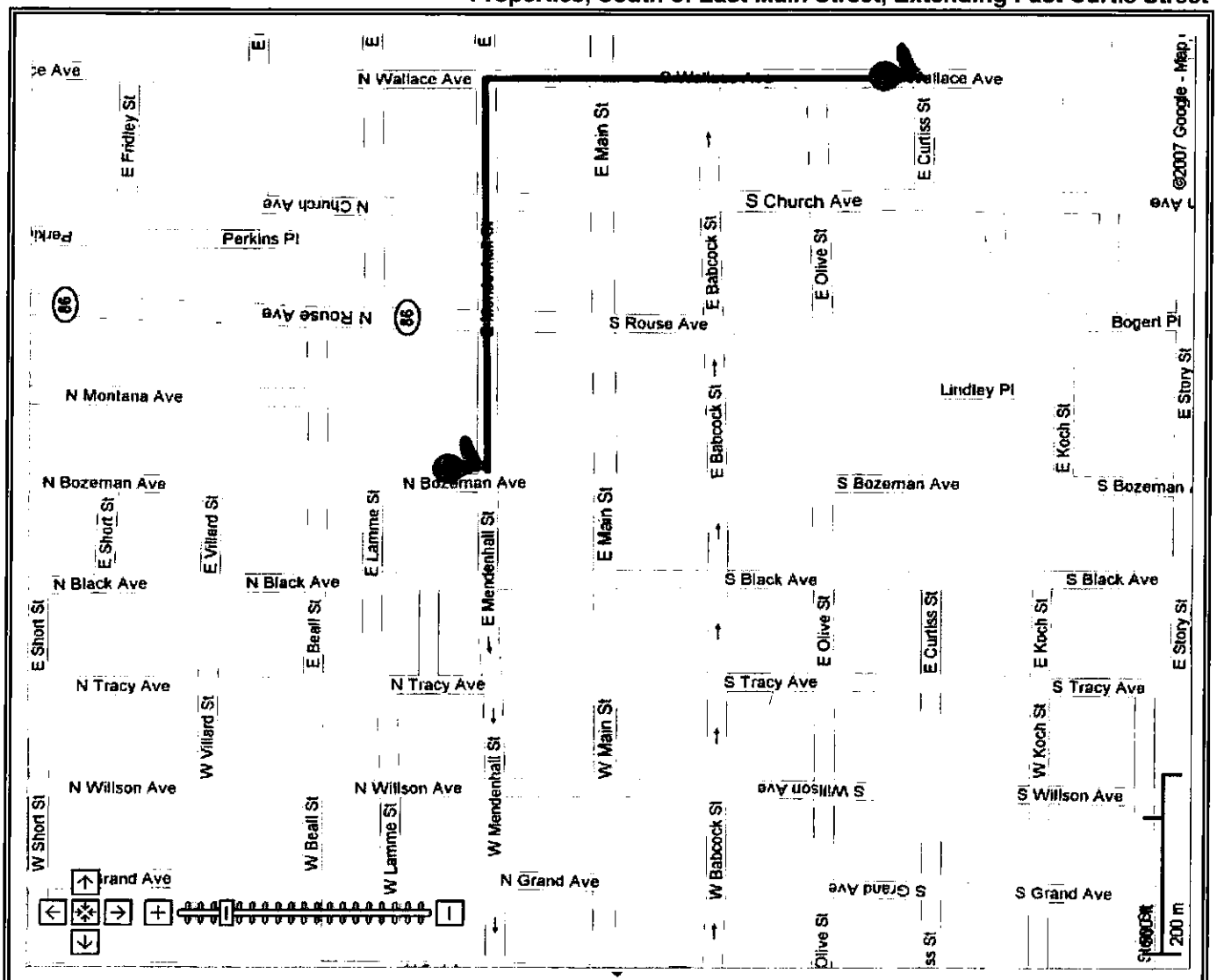
Secondary Provider (Occupatinal Health Clinic)

Name of Occ Clinic:	Gallatin Community Clinic	**Distance:**	0.5 miles
Address:	214 E. Mendenhall Street	**Time:**	3 minutes
Type of Service:	General		

Route: **See Attached Map:** Head north on South Wallace Avenue toward East Olive Street (0.3 miles); Turn left at East Mendenhall Street (0.3 miles).

In the case of a **NON-EMERGENCY/NON-LIFE THREATENING INCIDENT** (any injury, accident or near-miss event) call one of the corporate contacts listed on the wallet card (and above) prior to an Employee visiting a physician and implementing the following procedure:

1. Administer first aid immediately.
2. Tetra Tech employees call WorkCare (Tetra Tech contracted physicians) at 1-800-455-6155 for a triage call/discussion with an Occupational Health Nurse (OHN).
3. Mention that this is regarding an injury. At this point the nurse/physician will assist the employee/supervisor/H&S Coordinator to determine the best treatment plan. For example, he/she will recommend first aid or urgent care.
4. WorkCare will require the following information when a call is placed: Name of person calling, phone number, location, name of person injured, Social Security number, date and type of injury.



☐ Avoid highways Get reverse directions

From: E Curtiss St & S Wallace Ave
Bozeman, Mt 59715 Edit

Drive: 0.5 mi – about 3 mins

1. Head **north** on **S Wallace Ave** toward **E Olive St** 0.3 mi
2. Turn **left** at **E Mendenhall St** 0.3 mi

To: 214 E Mendenhall St
Bozeman, Mt 59715 Edit

Add destination ...

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Map data ©2007 NAVTEQ™

Response Plans

Medical - General

First Aid Kit: Type: Portable; Location: Vehicle

Eye Wash: Required?: Yes; Location: Vehicle

Safety Shower: Required?: No; Location: NA

Special First Aid Precautions:

Hydrofluoride on Site: No

Cyanides on Site: No

Other:

NA

Special Procedures:

Consult MSDS for appropriate first aid measures related to chemical exposures. Seek immediate medical attention when incidents warrant anything beyond minor first aid response.

The buddy system will be required and a trained CPR/First Aid person will be on-site.

Fire/Explosion

Special Procedures:

Fire extinguishers will be used to extinguish small fires. For any fire beyond the control of a portable fire extinguisher contact the local firefighting authorities as listed in the emergency contact section of this plan.

Fire Extinguisher: Type: ABC; Location: Vehicles

Spill Response

Special Procedures:

In the event of a spill from a vehicle or site discovery, a dirt barrier will be established with sorbant pads. All contaminated soild will be placed into properly labeled containment vessels.

Special Gear: Type:

Location:

Weather/Natural Disaster Emergency

Special Procedures:

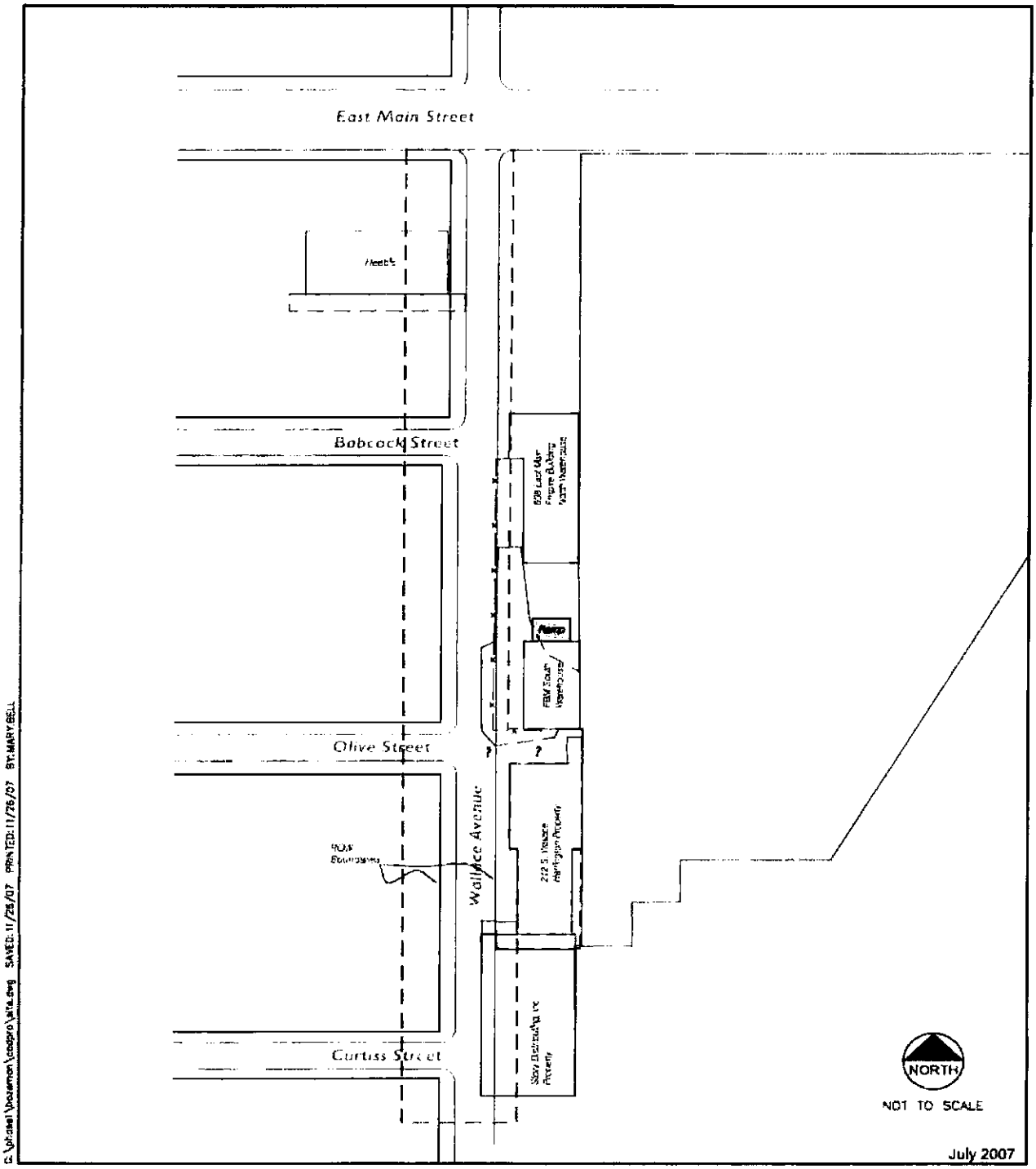
Cease work immediately and head for the agreed meet location (established in daily safety meetings). If travel is not possible seek immediate shelter as available.

Site Control Measures	
Work Zones	
Exclusion Zone:	NA
Decon Zone:	NA
Support Zone:	NA
Other Zones:	NA
Methods for Delineating Zones	
Work Zone Delineation Plan	NA
Delineation Equipment	NA
Security Measures	
No specific security measures will be employed. At the end of each day, the containination zone will be depicted	

Security Related Contacts

Agency	Contact Name	Phone Number

Site Map



Interior Area to be Included in SI
Exterior Area to be Included in SI
Fence
Previously Assessed Area
Proposed Pavement Assessment Area

7720035.100

Appendix A
CMC Bozeman Facility
Bozeman, Montana
FIGURE 2

Site Personnel and Certification Status

Name:	Keith Cron	**Medical Current:**	Yes
Title:	On-site project coordinator	**HAZWOPER Current:**	Yes
Task(s):	all	**Fit Test Current:**	Yes
CPR/First Aid:	Adult CPR 2004		
Other:	40-HAZWOPR, Asbestos Building Inspector, Asbestos Contractor/Supervisor		
Name:	Nathan Shumate	**Medical Current:**	Yes
Title:	SHSC	**HAZWOPER Current:**	Yes
Task(s):	2,3	**Fit Test Current:**	Yes
CPR/First Aid:	NA		
Other:	40-HAZWOPR, Asbestos Building Inspector, Asbestos Contractor/Supervisor		
Name:	Jesse Whitford	**Medical Current:**	Yes
Title:	Technician	**HAZWOPER Current:**	Yes
Task(s):	1	**Fit Test Current:**	NA
CPR/First Aid:	NA		
Other:	40-HAZWOPR		
Name:	Mike Foust	**Medical Current:**	Yes
Title:	Excavation Contractor	**HAZWOPER Current:**	Yes
Task(s):	4	**Fit Test Current:**	Yes
CPR/First Aid:			
Other:	40-HAZWOPR, Asbestos Building Inspector, Asbestos Contractor/Supervisor		
Name:		**Medical Current:**	
Title:		**HAZWOPER Current:**	
Task(s):		**Fit Test Current:**	
CPR/First Aid:			
Other:			

Medical Current:	All personnel, including visitors entering the Task 2 work areas must be certified as medically fit to work and to wear a respirator if appropriate.
Training Current:	All personnel, including visitors entering the Task 2 work areas must have certifications of completion of training in accordance with OSHA 29 CFR 1910.120.
Fit Test Current:	All on-site personnel for Tasks 2 and 3, including visitors entering any area requiring the use or potential use of any negative pressure respirator must have at a minimum, a qualitative fit test administered in accordance with OSHA 29 CFR 1910.134 or ANSI within the last 12 months. If site conditions require the use of a full face negative pressure air purifying respirator for protection against asbestos or lead, employees must have a qualitative fit test in accordance with OSHA 20 CFR 1910.1002 or 1025 within the last 6 months. * Bearded workers, who can not be fit-tested for a tight face fitting respirator, are required to wear a powered air purifying respirator (PAPR).
Note:	These requirements should be verified for any subcontractor personnel assigned to the site.

Training and Briefing Topics		
Note: The following topics will be covered as indicated (i.e., the initial site training, daily, monthly or periodically). Delete the X's corresponding to the topics that do not apply to this site. Indicate the frequency for the topics that do apply.		
Site characterization and analysis (29 CFR 1910.120 i)	X	daily
Physical Hazards	X	daily
Site Control (29 CFR 1910.120 d)	X	daily
Engineering Controls and Work Practices (29 CFR 1910.120 g)	X	daily
Heavy Machinery	X	daily
Backhoe	X	daily
Equipment	X	daily
Tools	X	daily
Ladders (29 CFR 1910.27 d)	X	initial
Overhead and Underground Utilities	X	daily
PPE (29 CFR 1910.120 g; and 1910.134)	X	daily
Respiratory Protection (29 CFR 1910.120 g; and 1910.134)	X	initial
Level C - Personal Protective Equipment	X	initial
Level D - Personal Protective Equipment	X	initial
Air Monitoring (29 CFR 1910.120 h)	X	initial
Decontamination (29 CFR 1910.120 k)	X	initial
Emergency Response (29 CFR 1910.120 l)	X	daily
Sanitation (29 CFR 1910.120 n)	X	daily
Other:		

Intrusive Activities Checklist

Will intrusive activities be performed for work under this HASP? Yes

If yes, describe the type(s) of intrusive activity. Test pit excavation (backhoe)

Subsurface Structures Present

Type	Present?	Located ?	Method Used/To Be Used for Locating
Electrical	Yes	Overhead (potential underground)	811 utilities locate
Gas	Yes	Prior to project	811 utilities locate
Water/Sewer	Yes	Prior to project	811 utilities locate
Product Line	No		
Product Tank			
Other			

Shut-Offs Located

Type	Location of Shut-Off
Electrical	Unknown
Gas	Unknown
Water/Sewer	Unknown
Product	NA
Other	

Emergency Contacts for Subsurface Structure Repair

Type	Appropriate Contact for Emergency Repair of Specific Subsurface Structure Type/Material
Electrical	Northwestern Energy - (888) 467-2353
Gas	Northwestern Energy - (888) 467-2353
Water/Sewer	City of Bozemen - (406) 582-2300
Product	NA
Other	

Procedure for Ensuring Unknown Substructures Identified	
Although potential known and unknown subsurface structures are identified per the above sections, there is always the potential for unkown subsurface structures to be encountered during intrusive activities. Therefore, a protocol needs to be established for each particular site. For this site, the following procedures will be followed for the intrusive activities identified above: (Delete the X's in front of the procedure(s) that do not apply to this site.)	
X	"One Call" or equivalent utility locate per the local system for the site will be made (this is mandatory on all sites)
X	Follow up with one-calls (on-site meeting requested during initial locate request)
Other Specific Subsurface Identification Requirements for this Site	

Required PPE and Equipment Checklist		
Delete the X's corresponding to the PPE/Equipment that does not apply to this site.		
HEALTH AND SAFETY BINDER / HASP, SITE CHECK IN/OUT PROCEDURES, ETC.		X
SAFETY GLASSES WITH SIDE SHIELDS		X
HARD HAT		X
STEEL-TOED BOOTS		X
GLOVES	TYPE: latex/nitrile/cloth/leather	X
RESPIRATOR	TYPE: Air-purifying (HEPA-filtered)	X
RESPIRATOR CARTRIDGES	TYPE: HEPA	X
HEARING PROTECTION	TYPE:	X
FIRE EXTINGUISHER		X
EYE WASH BOTTLE		X
FIRST AID KIT		X
DRINKING WATER	AMOUNT:	X
WASH WATER		X
UV PROTECTION		X

FIELD AUDITS

A field auditing program should be determined for the project based on the scope of work, duration of the project and degree of hazards associated with the tasks involved.

During the course of this project a minimum number of field audits will be conducted as follows: 1

The following person is responsible for ensuring the audits and associated corrective actions are completed: Keith Cron

Will known or suspect hazardous materials / dangerous goods be packaged and shipped? No

If shipping materials classified or suspected as hazardous materials or dangerous goods attach and follow Company Field Guidelines entitled "HAZARDOUS MATERIALS / DANGEROUS GOOD PACKAGING AND SHIPPING GUIDELINES".

Are there any identified or potential confined spaces associated with the project? Y

Will the project involve any confined space entry? No

Potential confined spaces include excavations greater than 4 feet deep. Tetra Tech does not anticipate the excavations will be more than 4 feet deep. No site personnel will enter excavations greater than 4 feet deep.

Will Tetra Tech employees or subcontractor employees be required to or have the potential to work alone? No

For which task(s) will a site worker be or have the potential to be working alone?

List the type of employees that will be permited to work alone and under what conditions:

Note: Personnel should not be allowed to work alone if there is high hazard potential associated with the site and/or task they will be performing, including but not limited to high physical hazard potential (such as heavy equipment operation, high voltage, intrusive activities, etc.), potential for extreme acute chemical exposure, high crime areas, remote sites, etc.

Lone Worker Check-In Procedure

Detail a daily check-in procedure for all site personnel who will be working alone. Note: There may be a need to detail different check-in procedures for different tasks, personnel etc.

Form of communication to be used for check-in:

Primary check-in person:

Alternate check-in person:

Check-In Schedule

Initial Check-In:

Periodic Check-In:

Final Check-Out:

Tetra Tech Compliance Agreement Form

PROJECT SCOPE: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

PROJECT NUMBER:

Tetra Tech Project No.:
1157720035.200

I have read, understood, and agree with the information set forth in this Health and Safety Plan along with any related attachments and discussed in the Personnel Health and Safety briefing.

NAME	SIGNATURE	DATE
Nathan Shumate	Nathan Shumate	12/17/07
Keith Cain		12/17/07
Jesse Whitford		12/18/07
Nathan Shumate	Nathan Shumate	12.18.07
Nathan Shumate	Nathan Shumate	12.19.07
Nathan Shumate	Nathan Shumate	12.20.07
Randy Cox		12/28/07

Subcontractor Notification of Hazards Acknowledgement Form

PROJECT SCOPE: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

PROJECT NUMBER:

Tetra Tech Project No.:
1157720035.200

I am aware that Tetra Tech has provided this Health and Safety Plan for my review to inform me of the hazards identified with the project site and tasks that Tetra Tech will perform. I understand that this Health and Safety Plan does not fulfill requirements for subcontractor health and safety plans related to the tasks which they will perform.

NAME	SIGNATURE	DATE
MIKE FROST	MMcFrost	12-19-07
R NAVARRO		12-19-07

TETRA TECH

Safety Excellence

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Worker / Visitor Log

PROJECT SCOPE: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

Tetra Tech Project No.: 1157720035.200

Name	Company / Organization	Date	Time In	Time Out
Nathan Shumate	T TECH	12.17.07	8:00	12:00
Nathan Shumate	T TECH	12.17.07	13:00	17:45
Keith Crow	T+	12/17/07	0800	1200
Keith Crow	T+	12/17/07	1300	1745
Nathan Shumate	T TECH	12.18.07	8:00	12:30
Keith Crow	T+	12/18/07	0800	12:30
Colleen Owen	DEQ	12/18/07	1045	?
Nathan Shumate	T TECH	12/18/07	13:30	17:45
Jesse Whitford	T+	12/18/07	0800	1700
Jesse Whitford	T+	12/19/07	0800	1355
mike Foust	ACM	12-19-07	730	1620
R NAVARRO	ACM	12-19-07	9:30	1620
Nathan Shumate	T+	12.19.07	0800	1800
[illegible]	T+	12.19.07	0800	1800
mike Foust	ACM	12-2007	8:30AM	1500
Ricardo NAVARRO	ACM	12.20.07	8:30	1500
Nathan Shumate	T TECH	12.20.07	0800	1545
Colleen Owen	DEQ	12.20.07	1330	1520
[illegible]	T+	1220 07	0820	1515
[illegible]	T+	12/28/07	0745	
Rawson W. English	T+	12/28/07	8:00	
mike Foust	ACM	12-28-07	8AM	
Colleen Owen	DEQ	12-28-07	0930	

TETRA TECH

Safety Excellence

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Daily Tailgate Meeting Form

PROJECT SCOPE: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

Tetra Tech Project No.: 1157720035.200

Topics Discussed	Meeting Facilitator
– Ladder Safety (use new fiberglass 4')	Nathan Shumate
– slips / trips / falls	**Meeting Date / Time**
– traffic (not a real issue, today @ least)	9:10 on 12.18.07

MEETING ATTENDEES

Name	Signature	Company / Organization
Nathan Shumate	Nathan Shumate	Tetra Tech
Keith Cran		T+

TETRA TECH

Safety Excellence

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Daily Tailgate Meeting Form

PROJECT SCOPE:	The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.	Tetra Tech Project No.: 1157720035.200

Topics Discussed	Meeting Facilitator
– LADDER SAFETY – STRAINS – SLIPS / TRIPS / FALLS	Nathan Shumate
	Meeting Date / Time
	12.17.07 / 0800

MEETING ATTENDEES

Name	Signature	Company / Organization
NATHAN SHUMATE	Nathan Shumate	T TECH
X Keith Cror		TT

TETRA TECH
Safety Excellence

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Daily Tailgate Meeting Form

PROJECT SCOPE: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

Tetra Tech Project No.: 1157720035.200

Topics Discussed	Meeting Facilitator
- cold stress - safety around big equipment - trench safety (sidewall collapse)	Nathan Shumate
	Meeting Date / Time
	12.19.07 / ~0845

MEETING ATTENDEES

Name	Signature	Company / Organization
Nathan Shumate	Nathan Shumate	Tetra Tech
Keith Cron	[signature]	Tt
X Nathan Shumate for: Jess Whitford	→	Tt
X Rubén Navarro	[signature]	XCM
X [illegible]	[signature]	PCN

TETRA TECH

Safety Excellence

CMC Bozeman Facility AT Wallace Avenue Right-of-Way and Selected Adjoining Properties, South of East Main Street, Extending Past Curtis Street

Daily Tailgate Meeting Form

PROJECT SCOPE: The current phase of work at the site will include assessment of pavement conditions and investigation of potential asbestos ore contamination is soil.

Tetra Tech Project No.: 1157720035.200

Topics Discussed	Meeting Facilitator
- working around big equipment & utilities/ structures (overhead power) - personnel decon - barricade traffic	Nathan Shumate
	Meeting Date / Time
	12.20.07 / 0845

MEETING ATTENDEES

Name	Signature	Company / Organization
Nathan Shumate	Nathan Shumate	Tetra Tech
Keith Cran		T+
X Ruben Navarro		ACM
X		ACM

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731698

EMSL Proj:
Analysis Date: 12/28/2007
Report Date: 12/28/2007

Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94

Sample	*Location*	*Sample Date*	*Volume*	*Fibers*	*Fields*	*LOD (fib/cc)*	*Fibers/ mm²*	*Fibers/ cc*	*Notes*
39 *040731698-0001*	SHB-ENVIRONMENTAL WEST	12/19/2007	750.30	<5.5	100	0.004	<7.0	<0.004	
40 *040731698-0002*	SHB-ENVIRONMENTAL EAST	12/19/2007	758.30	<5.5	100	0.004	<7.0	<0.004	
41 *040731698-0003*	SHB-ALL TEST PIT LOCATIONS	12/19/2007	750.10	<5.5	100	0.004	<7.0	<0.004	
42 *040731698-0004*	HEEBS-ENVE WEST (UPWIND)	12/20/2007	699.40	<5.5	100	0.004	<7.0	<0.004	
43 *040731698-0005*	HEEBS-ENVE EAST (DOWNWIND)	12/20/2007	663.80	<5.5	100	0.004	<7.0	<0.004	
44 *040731698-0006*	HEEBS-ALL TEST PIT LOCATIONS	12/20/2007	682.70	<5.5	100	0.004	<7.0	<0.004	

No discernable field blanks submitted with this sample set.

Analyst(s)
Delores Beard (6)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Limit of detection is 7 fibers/mm². The laboratory is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. This report relates only to the samples reported above. The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report may not be reproduced, except in full, without written approval by EMSL. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Analysis performed by EMSL Westmont (NY State ELAP #10872, AIHA #100194)

PCM-7.7.7

THIS IS THE LAST PAGE OF THE REPORT.

FED EX #: 7909-0467-1511

040731698

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

MAXI56

Company:	Tetra Tech	***Bill To:***	Tetra Tech
Address1:	1601 2nd Avenue North Suite 116	*Address1:*	1601 2nd Avenue North Suite 116
Address2:		*Address2:*	
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	U.S.A.	*Country:*	U.S.A.
Contact Name:	Keith Cron	***Attn:***	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@Tetratech.com	*Email:*	Keith.Cron@Tetratech.com
EMSL Rep:		***P.O. Number:***	
Project Name/Number: CMC Bozeman - 1157720035.200			

MATRIX			TURNAROUND			
☑ **Air**	☐ **Soil**	☐ **Micro-Vac**	☐ **3 Hours**	☐ **6 Hours**	☐ **Same Day or 12 Hours***	☐ **24 Hours (1 day)**
☐ **Bulk**	☐ **Drinking Water**		☐ **48 Hours (2 days)**	☐ **72 Hours (3 days)**	☐ **96 Hours (4 days)**	☐ **120 Hours (5 days)**
☐ **Wipe**	☐ **Wastewater**		☑ **144+ hours (6-10 days)**			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

***12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote**

PCM - Air
- ☑ NIOSH 7400(A) Issue 2: August 1994
- ☐ OSHA w/TWA
- ☐ Other:

PLM - Bulk
- ☐ EPA 600/R-93/116
- ☐ EPA Point Count
- ☐ NY Stratified Point Count
- ☐ PLM NOB (Gravimetric) NYS 198.1
- ☐ NIOSH 9002:
- ☐ EMSL Standard Addition:

SEM Air or Bulk
- ☐ Qualitative
- ☐ Quantitative

TEM Air
- ☐ AHERA 40 CFR, Part 763 Subpart E
- ☐ NIOSH 7402
- ☐ EPA Level II

TEM BULK
- ☐ Drop Mount (Qualitative)
- ☐ Chatfield SOP - 1988-02
- ☐ TEM NOB (Gravimetric) NYS 198.4
- ☐ EMSL Standard Addition:

PLM Soil
- ☐ EPA Protocol Qualitative
- ☐ EPA Protocol Quantitative
- ☐ EMSL MSD 9000 Method fibers/gram

TEM WATER
- ☐ EPA 100.1
- ☐ EPA 100.2
- ☐ NYS 198.2

TEM Microvac/Wipe
- ☐ ASTM D 5755-95 (quantative method)
- ☐ Wipe Qualitative

XRD
- ☐ Asbestos
- ☐ Silica NIOSH 7500

OTHER
- ☐

07 DEC 28 AM 11:29
RECEIVED
EMSL
WESTMONT NJ

SAMPLES ACCEPTED
FOR ANALYSIS BY
EMSL ANALYTICAL INC.

040731698

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 39 - 44 **Total Samples #:** 6

Relinquished: NATHAN Shumate **Date:** 12.27.07 **Time:** P.M.

Received: KW FX **Date:** **Time:** 940

Relinquished: **Date:** **Time:**

Received: **Date:** **Time:**

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
39	SHB - ENVIRONMENTAL WEST	~~752 L~~ → 750.3
40	SHB - ENVIRONMENTAL EAST	~~757.2 L~~ → 758.3
41	SHB - All TEST PIT LOCATIONS	~~749.7 L~~ → 750.1
42	HEEBS - ENVE WEST (upwind)	~~945.5 L~~ → 699.4
43	HEEBS - ENVE EAST (downwind)	~~897.7 L~~ → 663.8
44	HEEBS - All test pit locations	~~926.2 L~~ → 682.7
	SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL INC.	

N.S.

07 DEC 28 AM 1:29
RECEIVED
EMSL
WESTMONT, NJ

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **1157720035.200 CMC BOZEMAN FACILITY-SI**

Customer ID: MAXI56
Customer PO:
Received: 01/09/08 9:15 AM
EMSL Order: 040800463

EMSL Proj:
Analysis Date: 1/9/2008
Report Date: 1/9/2008

Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94

Sample	*Location*	*Sample Date*	*Volume*	*Fibers*	*Fields*	*LOD (fib/cc)*	*Fibers/ mm²*	*Fibers/ cc*	*Notes*
1-122807 STORY ENV W *040800463-0001*	UPWIND ACROSS WALLACE AVE	12/28/2007	1169.00	<5.5	100	0.002	<7.0	<0.002	
2-122807 STORY ENV E *040800463-0002*	DOWNWIND @ LIBRARY PARKING LOT	12/28/2007	1165.00	<5.5	100	0.002	<7.0	<0.002	
3-122807 STORY TP *040800463-0003*	@ TP LOCATION STORY TP-1-STORY-TP-7 THROUGHOUT DA	12/28/2007	1115.00	<5.5	100	0.002	<7.0	<0.002	

No discernable field blanks submitted with this sample set.

Analyst(s)

Delores Beard (3)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Limit of detection is 7 fibers/mm². The laboratory is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. This report relates only to the samples reported above. The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report may not be reproduced, except in full, without written approval by EMSL. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Analysis performed by EMSL Westmont (NY State ELAP #10872, AIHA #100194)

THIS IS THE LAST PAGE OF THE REPORT.

040800463

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Company:	Tetra Tech	***Bill To:***	Tetra Tech
Address1:	1601 2nd Avenue North	*Address1:*	1601 2nd Avenue North
Address2:	Suite 116	*Address2:*	Suite 116
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59404	*Zip/Post Code:*	59404
Country:	USA	*Country:*	USA
Contact Name:	Keith Cron	***Attn:***	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@tetratech.com	*Email:*	Keith.Cron@tetratech.com
EMSL Rep:	Stephen Siegel	***P.O. Number:***	
Project Name/Number:	1157720035.200 CMC Bozeman Facility - SI		

MATRIX			TURNAROUND			
[X] **Air**	[ ] **Soil**	[ ] **Micro-Vac**	[ ] **3 Hours**	[ ] **6 Hours**	[ ] **Same Day or 12 Hours***	[ ] **24 Hours (1 day)**
[ ] **Bulk**	[ ] **Drinking Water**		[ ] **48 Hours (2 days)**	[ ] **72 Hours (3 days)**	[ ] **96 Hours (4 days)**	[ ] **120 Hours (5 days)**
[ ] **Wipe**	[ ] **Wastewater**		[X] **144+ hours (6-10 days)**			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

***12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote**

PCM - Air
- [X] NIOSH 7400(A) Issue 2: August 1994
- [ ] OSHA w/TWA
- [ ] Other:

PLM - Bulk
- [ ] EPA 600/R-93/116
- [ ] EPA Point Count
- [ ] NY Stratified Point Count
- [ ] PLM NOB (Gravimetric) NYS 198.1
- [ ] NIOSH 9002:
- [ ] EMSL Standard Addition:

SEM Air or Bulk
- [ ] Qualitative
- [ ] Quantitative

TEM Air
- [ ] AHERA 40 CFR, Part 763 Subpart E
- [ ] NIOSH 7402
- [ ] EPA Level II

TEM BULK
- [ ] Drop Mount (Qualitative)
- [ ] Chatfield SOP - 1988-02
- [ ] TEM NOB (Gravimetric) NYS 198.4
- [ ] EMSL Standard Addition:

PLM Soil
- [ ] EPA Protocol Qualitative
- [ ] EPA Protocol Quantitative
- [ ] EMSL MSD 9000 Method fibers/gram

TEM WATER
- [ ] EPA 100.1
- [ ] EPA 100.2
- [ ] NYS 198.2

TEM Microvac/Wipe
- [ ] ASTM D 5755-95 (quantative method)
- [ ] Wipe Qualitative

XRD
- [ ] Asbestos
- [ ] Silica NIOSH 7500

OTHER
- [ ]

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC.

Sent Fed Ex Via Tracking # 798347004364

040800463

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 1 - 3 **Total Samples #:** 3

Relinquished: [signature] **Date:** 1/8/08 **Time:** P.M.

Received: DM-FX-915A **Date:** **Time:**

Relinquished: **Date:** **Time:**

Received: **Date:** **Time:**

	SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
1 -	122807 StoryENW	Upwind accross Wallace Ave.	1169 Liters
2 -	122807 StoryENE	Downwind @ Library Parking Lot	1165 Liters
3 -	122807 StoryTP	@ TP Locations StoryTP-1 - StoryTP-? throughout Day	1115 Liters

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL INC.

APPENDIX C

Documentation of Accreditation

ABIH®

american board of industrial hygiene®

organized to improve the practice of industrial hygiene
proclaims that

Keith C. Cron

having met all requirements through
education, experience and examination,
is hereby certified in the

COMPREHENSIVE PRACTICE
of
INDUSTRIAL HYGIENE

and has the right to use the designations

CERTIFIED INDUSTRIAL HYGIENIST

CIH

Certificate Number: 9364 CP

Awarded: November 1, 2007

Expiration Date: June 1, 2013

Barbara J. Dawson
Chair ABIH

Lynn C. O'Donnell
Executive Director ABIH

KEITH C CRON

has met the requirements of Title 17, Chapter 74.3, Subchapter 3, of the Administrative Rules of Montana for accreditation in the following asbestos-type occupation(s) as indicated by an expiration date(s).

MTA-3043

CS	MP	PD	IN
04/13/2008		01/24/2008	04/24/2008
WK			

MT DEQ Asbestos Control Program

NATHAN W SHUMATE

has met the requirements of Title 17, Chapter 74.3, Subchapter 3, of the Administrative Rules of Montana for accreditation in the following asbestos-type occupation(s) as indicated by an expiration date(s).

MTA-3176

CS	MP	PD	IN
04/13/2008			02/20/2008
WK			

MT DEQ Asbestos Control Program

APPENDIX D

Tetra Tech 6-16-08 Pavement Condition Assessment

TETRA TECH

June 16, 2008

Mr. Tim Cooper
City of Bozeman
P.O. Box 1230
Bozeman, Montana 59771

RE: CMC Bozeman Facility
Revised Pavement Assessment
Bozeman, Montana

In accordance with Montana Department of Environmental Quality's (DEQ's) letter dated December 6, 2007, to the City of Bozeman (City) indicating approval of Tetra Tech's *Supplemental Investigation Workplan – Final Revision*, dated November, 2007, Tetra Tech determined the Pavement Condition Index (PCI), and overall pavement rating for Wallace Avenue from Curtiss Street to East Main Street. The initial pavement assessment was conducted on December 18 and 19, 2007 by Mr. Jess Whitford of Tetra Tech, and a follow-up assessment was conducted on June 12, 2008 by Mr. Marco Fellin of Tetra Tech to include areas that could not be assessed in 2007 due to snow and ice, and also to include several other areas of concern that were not addressed in the initial assessment.

The overall assessment was performed in general accordance with American Standard for Testing and Materials (ASTM) D5340-04, "Airport Pavement Condition Index Surveys," and was modified for the use of quantifying the pavement condition and rating of asphaltic concrete streets and parking areas, along with Portland Cement concrete sidewalks, curb, valley gutter and parking entrance aprons.

The PCI is a numerical rating of the pavement condition that ranges from 0 to 100, with 0 being the worst possible condition and 100 being the best possible condition. The pavement condition rating is a description of the pavement condition as a function of the PCI value that varies from "Failed" to "Excellent." The pavement distress is an external indicator of pavement deterioration caused by loading, environmental factors, construction deficiencies or a combination thereof. The PCI is not a measure of structural capacity, but provides an objective and rational basis for determining maintenance and repair needs and priorities. Typical distresses for asphalt pavement include cracking, rutting and weathering. Typical distresses for concrete are cracking, scaling and spalling. The severity levels of distress for both asphalt and concrete are low, medium and high.

The assessment area was designated by branch, section and sample unit. The branch assessed, as indicated above, was Wallace Avenue and portions of intersecting streets

Tetra Tech
2525 Palmer Street, Suite 2, Missoula, Montana 59808
Tel 406.543.3045 Fax 406.543.3088 www.tetratech.com

from Curtiss Street to East Main Street. Boundaries of the assessment were limited to the right of way boundaries as shown in Figure 1. The sections assessed were broke down into areas within each block, such as intersecting streets, parking areas, loading docks, sidewalks, valley gutters, parking entrance aprons, and curbs. The sample units for each section are defined as asphalt pavement or Portland cement concrete. Types of distress observed for asphalt pavement include alligator cracking, block cracking, depression, longitudinal and transverse cracking, patching, raveling, weathering and swelling. Rutting of the asphalt pavement was not observed during the assessment. Slight rutting of the asphalt surface may become evident during the spring/early summer months in areas that are more heavily traveled, once frost is out of the ground, depending upon subgrade soil type, and condition and type of base course aggregate. Distress types encountered in concrete included longitudinal, transverse and diagonal cracking, patching/utility cut, scaling/crazing, settlement and spalling.

Each distress type and severity level were measured either in square feet or linear feet, depending on the type of distress. In general, the distress at each severity level were summed, and calculations performed in accordance with ASTM procedure D5340, to derive at the PCI value. The determination of severity level; low, medium or high, varies depending on the type of distress. A copy of the field notes, distress types observed, and deduct values is included in Attachment C. A brief description of distress types encountered, are explained as follows:

Asphalt Pavement Distress

Rutting: This is a surface depression, typically in the wheel path. Rutting stems from permanent deformation in any of the pavement layers or subgrade, usually caused by lateral movement of the materials due to traffic loads.

Alligator Cracking: Typically referred to as fatigue cracking, is caused by repeated traffic loading, and are interconnecting cracks caused by fatigue failure. The cracks connect, forming many-sided, sharp angled pieces that develop a pattern resembling chicken wire. This type of distress is typically located only in traffic areas, such as wheel paths. As shown in figure 1, an increased quantity of alligator cracking is apparent with areas receiving a higher volume of traffic. During our assessment, the highest volume of traffic was observed to be from Babcock Street to East Main Street, with the next highest volume of traffic occurring between Olive Street and Babcock Street. The lowest volume of traffic was noted between Curtiss Street to Olive Street. Alligator cracking is considered a major structural distress, because the cracking is typically through out the full depth of the asphalt pavement thickness.

Block Cracking: Similar to alligator cracking, except that it occurs in larger rectangular portions of the pavement area, and may occur in non traffic areas.

Depression: A depression is a localized area in the pavement that has elevations slightly lower than those of the surrounding pavement. A severe case of a depression may be considered a pothole. In many instances, light depressions are not noticeable until after a rain, when ponding water creates “birdbath” areas.

Longitudinal and Transverse Cracking: Generally a longitudinal crack will appear parallel to centerline, or lay down direction, and transverse cracks extend across the pavement at approximately right angles. This type of distress is not generally related to repeated loading, but may be caused due to poor joint construction or shrinkage of the pavement surface.

Patching: A patch is considered a defect no matter how well it is performing. Patch work is typically performed as a surface repair or after accessing underground utilities.

Raveling and Weathering: Weathering is wearing of the surface to the dislodging of aggregates and loss of asphalt.

Portland Cement Concrete Distress

Longitudinal/Transverse and Diagonal Cracking: These types of cracks divide the slab into two or three pieces, and are usually caused by the combination of repeated loading and shrinkage stresses.

Scaling, Map Cracking and Crazing: This refers to a network of shallow, fine cracks that extend only through the upper surface. This condition may be caused by over finishing of the concrete, resulting in scaling. This condition may also be caused by deicing chemicals, or continued freeze thaw cycles.

Settlement: This condition is a difference in elevation at a joint or crack, and is caused by upheaval or consolidation.

Corner Spalling: This is a raveling or breakdown of the concrete within approximately 2' of a corner.

Patching/Utility Cut: This is a simple patch that has occurred as a result of accessing underground utilities or other excavation work.

Attachment A contains a summary of each section assessed, type of sample unit, and PCI Value and Rating for each sample unit, including; listing of distress types, and severity and quantity of distress types observed for each sample unit. The seven additional pavement sections (three asphalt sections and four concrete sections) reviewed on June 12, 2008 are included at the end of the summary table. For purposes of suggested remediation for the various distress types, the priority of action is based on the low, medium, and high distress ratings listed in Attachment A. Immediate action is suggested for high distress ratings, which would include complete reconstruction of the pavement section. A medium distress rating also suggests that immediate action should be taken, which could include isolated repairs/patches, and preventative maintenance such as crack sealing or applying a seal coat. Pavement sections with low distress ratings suggest that no immediate action is required.

Attachment B contains a figurative representation of the asphalt pavement sections with either medium or high severity distress encountered during the field assessment. Immediate action should be taken on all of these sections. Due to the scale of Figure 1 in Appendix B, distress type and severity level of Portland Cement Concrete, including curb, sidewalk, parking entrance aprons and valley gutter, are not shown. Please refer to Attachment A for description and location of concrete distress types and quantities.

Sincerely,

Tetra Tech

Marco Fellin, P.E.
Project Geotechnical Engineer

Attachment A: Tables of PCI Values with Ratings
Attachment B: Figure 1. Distress Type and Severity Level
Attachment C: Survey Data Sheets and Field Notes

cc w/attachments: Keith Cron, Tetra Tech, 1601 2nd Avenue North, Suite 116, Great Falls, Montana 59401

TETRA TECH

ATTACHMENT A:
Tables of PCI Values with Ratings

PCI ASSESSMENT SUMMARY
Tetra Tech Project No. 1157720035.200

BRANCH: WALLACE STREET

Section	Type of Sample Unit	PCI	Rating
Curtis Street to Wallace Street	Asphalt Pavement	65	Good
Curtiss Street to Olive Street	Asphalt Pavement	46	Fair
Parking at 212 S. Wallace	Asphalt Pavement	46	Fair
Loading Dock Entrance/Parking; N end of 212 Wallace Street	Asphalt Pavement	50	Fair
S edge of Olive Street to S edge of Babcock Street	Asphalt Pavement	44	Fair
Olive Street to Wallace Street	Asphalt Pavement	52	Fair
Babcock Street to Wallace Street	Asphalt Pavement	55	Fair
S edge of Babcock to East Main Street	Asphalt Pavement	26	Poor
Sidewalk; W side of Wallace Street, Curtiss Street to Olive Street	Portland Cement Concrete	82	Very Good
Curtiss Street Valley Gutter	Portland Cement Concrete	56	Fair
W side of Wallace Street between Curtiss Street and Olive Street; Parking Lot entrance Apron	Portland Cement Concrete	50	Fair
North and South Curb radius of Curtiss Street	Portland Cement Concrete	100	Excellent
Curb; W side of Wallace Street, 142' N of Curtiss Street to Parking Lot entrance apron	Portland Cement Concrete	50	Fair
Curb: W side of Wallace Street from Parking Lot entrance apron to Olive Street	Portland Cement Concrete	90	Excellent
SW Curb radius on Olive Street	Portland Cement Concrete	70	Good
NW Curb radius on Olive Street	Portland Cement Concrete	18	Very Poor
Curb; W side of Wallace Street, Olive street to Babcock Street	Portland Cement Concrete	44	Fair
Sidewalk: W side of Wallace street, First 22 section N of Olive Street	Portland Cement Concrete	55	Fair
Sidewalk: W side of Wallace street, Sections 23-38 N of Olive Street	Portland Cement Concrete	95	Excellent
Sidewalk: W side of Wallace street, Sections 39-46 N of Olive Street	Portland Cement Concrete	0	Failed
Sidewalk: W side of Wallace street, Sections 47-53 N of Olive Street	Portland Cement Concrete	95	Excellent
Sidewalk: W side of Wallace street, Sections 54-66 N of Olive Street	Portland Cement Concrete	66	Good
Sidewalk: W side of Wallace street, First 29 sections N of Babcock Street to SE corner of Heeb's Market	Portland Cement Concrete	70	Good
Sidewalk: W side of Wallace street, E end of Heeb's Market, (60' length)	Portland Cement Concrete	32	Poor
Sidewalk: W side of Wallace street from NE corner of Heeb's Market, to Parking Lot entrance apron	Portland Cement Concrete	42	Fair
Parking Lot entrance apron to Heeb's Market	Portland Cement Concrete	95	Excellent
Sidewalk: W side of Wallace street from N end of Heeb's Market Parking Lot entrance apron to East Main Street	Portland Cement Concrete	100	Excellent
Curb radius, N and S side of Babcock Street	Portland Cement Concrete	70	Good
Curb; W side of Wallace Street, 91' N of Babcock Street to garage entrance apron	Portland Cement Concrete	70	Good

BRANCH: WALLACE STREET (continued)

Residential entrance sidewalk: 7' length:			
Curb radius at East Main Street and W side of Wallace Street	Portland Cement Concrete	100	Excellent
107 Wallace Street	Portland Cement Concrete	70	Good
113 Wallace Street	Portland Cement Concrete	95	Excellent
115 Wallace Street	Portland Cement Concrete	70	Good
117 Wallace Street	Portland Cement Concrete	70	Good
121 Wallace Street	Portland Cement Concrete	70	Good
Business sidewalk entrance:			
Springer Group	Portland Cement Concrete	95	Excellent
Gallatin Valley Seed-Main Entrance	Portland Cement Concrete	95	Excellent
Gallatin Valley Seed-South Entrance	Portland Cement Concrete	95	Excellent
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Sections Below were Surveyed on June 12 - 2008			
Eastern Parking area in Heeb's Market, just west of concrete sidewalk	Asphalt Pavement	80	Very Good
East end of Alley behind Heeb's Market.	Asphalt Pavement	100	Excellent
Entrance to Babcock apartments from alley behind Heeb's.	Asphalt Pavement	66	Good
4-foot wide concrete slab along entire south side of Heeb's Market.	Portland Cement Concrete	80	Very Good
Concrete curb west of Wallace Ave. extending between alley and entrance to Heeb's Market.	Portland Cement Concrete	92	Excellent
Residential Concrete Driveway south of alley behind Heeb's Market and west of Wallace Ave.	Portland Cement Concrete	30	Poor
Residential Concrete Driveway south of alley behind Heeb's Market, approximately 100 feet west of Wallace Ave.	Portland Cement Concrete	42	Fair

Please see the following pages for a detailed summary including assessment distress types encountered, severity and quantity, for each sample unit.

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Curtiss Street to Wallace Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 350 sq. ft

Type of Distress Observed	Severity	Quantity
5	Medium	4 sq. ft.
3	Low	84 sq. ft.
6	Low	21 Lf
PCI = 65	Rating: Good	

PCI	RATING SCALE
0-10	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-86	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Long. & Trans Cracking
7. Oil Spillage
8. Patching
9. Polished Aggregate
10. Raveling/Weathering
11. Rutting
12. Shoving
13. Slippage Cracking
14. Swell

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Curtiss Street to Olive Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 11,310 sq. ft.

Type of Distress Observed	Severity	Quantity
6	Low	282 Lf
1	Low	658 sq. ft.
1	Medium	56 sq. ft.
5	Low	269 sq. ft.
5	Medium	32 sq. ft.
5	High	5 sq. ft.
PCI = 46	Rating: Fair	

PCI	RATING SCALE
0-11	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-87	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Long. & Trans Cracking
7. Oil Spillage
8. Patching
9. Polished Aggregate
10. Raveling/Weathering
11. Rutting
12. Shoving
13. Slippage Cracking
14. Swell

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Parking at 212 S Wallace Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 6955 sq. ft.

Type of Distress Observed	Severity	Quantity
1	Low	655 sq. ft.
5	Low	40 sq. ft.
6	Low	61 Lf.
6	Medium	16 Lf.
PCI = 46	Rating: Fair	

PCI	RATING SCALE	DISTRESS TYPES	
0-12	Failed	1. Alligator Cracking	8. Patching
11-25	Very Poor	2. Bleeding	9. Polished Aggregate
26-40	Poor	3. Block Cracking	10. Raveling/Weathering
41-56	Fair	4. Corrugation	11. Rutting
57-70	Good	5. Depression	12. Shoving
71-88	Very Good	6. Long. & Trans Cracking	13. Slippage Cracking
87- 100	Excellent	7. Oil Spillage	14. Swell

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Loading Dock Entrance/Parking
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 3306 sq. ft.

Type of Distress Observed	Severity	Quantity
5	High	225 sq. ft.*
6	Low	40 Lf.
PCI = 50	Rating: Fair	

* Note: Depression appeared to be intentionally constructed to divert drainage away from adjacent window well.

PCI	RATING SCALE
0-13	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-89	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Long. & Trans Cracking
7. Oil Spillage
8. Patching
9. Polished Aggregate
10. Raveling/Weathering
11. Rutting
12. Shoving
13. Slippage Cracking
14. Swell

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: S edge of Olive Street to S edge of Babcock Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 10,710 sq. ft.

Type of Distress Observed	Severity	Quantity
8	Low	329 sq. ft.
1	Low	1170 sq. ft.
6	Low	75 Lf.
6	Medium	37 Lf.
5	Medium	56 sq. ft.
5	Low	62 sq. ft.
14	High	60 sq. ft.
PCI = 44	Rating: Fair	

PCI	RATING SCALE
0-14	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-90	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Long. & Trans Cracking
7. Oil Spillage
8. Patching
9. Polished Aggregate
10. Raveling/Weathering
11. Rutting
12. Shoving
13. Slippage Cracking
14. Swell

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Olive Street to Wallace Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 450 sq. ft.

Type of Distress Observed	Severity	Quantity
8	Low	30 sq. ft.
5	Medium	60 sq. ft.
PCI = 52	Rating: Fair	

PCI	RATING SCALE	DISTRESS TYPES	
0-15	Failed	1. Alligator Cracking	8. Patching
11-25	Very Poor	2. Bleeding	9. Polished Aggregate
26-40	Poor	3. Block Cracking	10. Raveling/Weathering
41-56	Fair	4. Corrugation	11. Rutting
57-70	Good	5. Depression	12. Shoving

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Babcock Street to Wallace Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 450 sq. ft.

Type of Distress Observed	Severity	Quantity
8	Low	210 sq. ft.
6	Medium	32 Lf.
PCI = 55	Rating: Fair	

PCI	RATING SCALE	DISTRESS TYPES	
0-16	Failed	1. Alligator Cracking	8. Patching
11-25	Very Poor	2. Bleeding	9. Polished Aggregate
26-40	Poor	3. Block Cracking	10. Raveling/Weathering
41-56	Fair	4. Corrugation	11. Rutting
57-70	Good	5. Depression	12. Shoving

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: S edge of Babcock Street to East Main Street
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 10,688 sq. ft.

Type of Distress Observed	Severity	Quantity
1	Medium	570 sq. ft.
1	Low	755 sq. ft.
6	High	30 Lf.
6	Low	250 Lf.
8	Low	360 sq. ft.
8	Medium	47 Lf.
3	Low	250 sq. ft.
PCI = 26	Rating: Poor	

PCI	RATING SCALE
0-17	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good

DISTRESS TYPES

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
8. Patching
9. Polished Aggregate
10. Raveling/Weathering
11. Rutting
12. Shoving

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: W Sidewalk, Curtiss St. to Oliver
Number of Sample Units in Section: 66
Number of Sample Units Assessed: 66
Total Area Represented: 66 (5'x5')

Type of Distress Observed	Severity	Quantity
3	Low	2 slabs
3	Medium	1 slab
10	Low	3 slabs
11	Medium	6 slabs
PCI = 82	Rating: Very Good	

Location: Curtiss St. Valley Gutter
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: Entire Valley Gutter

Type of Distress Observed	Severity	Quantity
3	Medium	2 slabs
PCI = 56	Rating: Fair	

PCI	RATING SCALE
0-18	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-91	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: W Parking Entrance Apron
Between Curtiss and Olive
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 2 slabs

Type of Distress Observed	Severity	Quantity
3	Medium	2 slabs
PCI = 50	Rating: Fair	

Location: N & S Curb radius; Curtiss St.

Number of Sample Units in Section: 2
Number of Sample Units Assessed: 2
Total Area Represented: 2 curb radius

Type of Distress Observed	Severity	Quantity
None		2 curb radius
PCI = 100	Rating: Excellent	

PCI	RATING SCALE
0-19	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-92	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: W Curb, 142' N of Curtis to parking entrance
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 142 Lf.

Type of Distress Observed	Severity	Quantity
15	Medium	115 Lf.
PCI = 50	Rating: Fair	

Location: W curb from parking entrance to Olive St.
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 164 Lf.

Type of Distress Observed	Severity	Quantity
15	Low	Minimal
PCI = 90	Rating: Excellent	

PCI	RATING SCALE
0-20	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-93	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: SW curb radius on Olive St.

Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 1 Curb Radius

Type of Distress Observed	Severity	Quantity
15	Low	1 curb
PCI = 70	Rating: Good	

Location: NW curb radius on Olive St.

Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 1 Curb radius

Type of Distress Observed	Severity	Quantity
15	High	1 curb
PCI = 18	Rating: Very Poor	

PCI	RATING SCALE
0-21	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-94	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: W Curb, Olive St. to Babcock St.

Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 299 Lf.

Type of Distress Observed	Severity	Quantity
10	Low	197Lf.
10	Medium	17 Lf.
10	High	19 Lf.
PCI = 44	Rating: Fair	

Note: The first 31', and last 40' of curb was covered with snow and ice.

Location: Sidewalk, W side of Wallace St., 1st 22 sections N of Olive St.

Number of Sample Units in Section: 22
Number of Sample Units Assessed: 22
Total Area Represented: 22 (5'x5')

Type of Distress Observed	Severity	Quantity
3	Low	4 slabs
10	Low	2 slabs
10	High	2 slabs
7	Low	1 slab
PCI = 55	Rating: Fair	

PCI	RATING SCALE
0-22	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-95	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Sidewalk, W side of Wallace St. , Sections 23-38 N of Olive St.

Number of Sample Units in Section: 15
Number of Sample Units Assessed: 15
Total Area Represented: 15-(5'x5')

Type of Distress Observed	Severity	Quantity
7	Low	1 slab
PCI = 95	Rating: Excellent	

Location: Sidewalk, W side of Wallace St., sections 39-46 N of Olive St (35' N of 107 Wallace St.)

Number of Sample Units in Section: 7
Number of Sample Units Assessed: 7
Total Area Represented: 7 (5'x5')

Type of Distress Observed	Severity	Quantity
10	High	7 slabs
PCI = 0	Rating: Failed	

PCI	RATING SCALE
0-23	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-96	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Sidewalk, W side of Wallace St.
47-53 sections N of Olive St.
Number of Sample Units in Section: 6
Number of Sample Units Assessed: 6
Total Area Represented: 6-(5'x5')

Type of Distress Observed	Severity	Quantity
None	Low	Minimal
PCI = 95	Rating: Excellent	

Location: Sidewalk, W side of Wallace St.
54-66 sections N of Olive St.
Number of Sample Units in Section: 12
Number of Sample Units Assessed: 12
Total Area Represented: 12-(5'x5')

Type of Distress Observed	Severity	Quantity
3	Low	2 slabs
10	Low	9 slabs
PCI = 66	Rating: Good	

PCI	RATING SCALE
0-24	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-97	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: W sidewalk, N of Babcock to SE corner of Heeb's Market
Number of Sample Units in Section: 29
Number of Sample Units Assessed: 29
Total Area Represented: 29-(5'x5')

Type of Distress Observed	Severity	Quantity
10	Low	19 slabs
3	Low	5 slabs
PCI = 70 Rating: Good		

Location: Sidewalk, E end of Heeb's 60' length
Number of Sample Units in Section: 3
Number of Sample Units Assessed: 3
Total Area Represented: 678 sq. ft.

Type of Distress Observed	Severity	Quantity
7	Low	1 slab
11	High	1 slab
3	Medium	3 slabs
3	Low	3 slabs
PCI = 32 Rating: Poor		

PCI	RATING SCALE
0-25	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-98	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Sidewalk, NE corner of Heeb's to parking entrance
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 271 sq. ft.

Type of Distress Observed	Severity	Quantity
3	Low	1 slab
PCI = 42	Rating: Fair	

Location: Sidewalk, Heeb's parking entrance to East Main St.
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 339 sq. ft.

Type of Distress Observed	Severity	Quantity
None	Low	Minimal
PCI = 100	Rating: Excellent	

PCI	RATING SCALE
0-26	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-99	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Heeb's parking entrance

Number of Sample Units in Section: 8
Number of Sample Units Assessed: 8
Total Area Represented: 8- (5'x5')

Type of Distress Observed	Severity	Quantity
None	Low	Minimal
PCI =95 Rating: Excellent		

Location: Curb radius, N&S side of Babcock

Number of Sample Units in Section: 2 curb radius
Number of Sample Units Assessed: 2 curb radius
Total Area Represented: N&S curb radius

Type of Distress Observed	Severity	Quantity
10	Low	2 curb radius
15	Low	2 curb radius
PCI = 70 Rating: Good		

PCI	RATING SCALE
0-27	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-100	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: W Curb, 91' N of Babcock to garage entrance
Number of Sample Units in Section: 91 Lf
Number of Sample Units Assessed: 91 Lf.
Total Area Represented: 91 Lf.

Type of Distress Observed	Severity	Quantity
10	Low	91 Lf.
PCI = 70	Rating: Good	

Location: W Curb, SE corner of Heeb's parking to parking entrance
Number of Sample Units in Section:
Number of Sample Units Assessed:
Total Area Represented:

Type of Distress Observed	Severity	Quantity
NA*		
Covered with snow and ice in December 2007, rated on June 12, 2008, see below.		

*Not Applicible

PCI	RATING SCALE
0-28	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-101	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Curb radius at East Main And Wallace St.

Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 1 curb radius

Type of Distress Observed	Severity	Quantity
None	Low	Minimal
PCI = 100	Rating: Excellent	

Location: Entrance sidewalks; Springer Group Gallatin Valley Seed, Main ent. and South ent. And 113 Wallace St.

Number of Sample Units in Section: 3
Number of Sample Units Assessed: 3
Total Area Represented: 3 Entrance sidewalks

Type of Distress Observed	Severity	Quantity
None	Minimal	3
PCI = 95	Rating: Excellent	

PCI	RATING SCALE
0-29	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-102	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Residential entrance Sidewalks; 107, 115, 117 and 121 Wallace St.
Number of Sample Units in Section: 4
Number of Sample Units Assessed: 4
Total Area Represented: 4 Entrance sidewalks

Type of Distress Observed	Severity	Quantity
10	Low	4 slabs
15	Low	4 slabs

PCI	RATING SCALE	DISTRESS TYPES	
0-30	Failed	1. Blow Up	8. Popouts
11-25	Very Poor	2. Corner Break	9. Pumping
26-40	Poor	3. Long/Trans/Diagonal Crack	10. Scaling/Map Cracking
41-56	Fair	4. Durability Crack	11. Settlement
57-70	Good	5. Joint Seal Damage	12. Shattered Slab
71-103	Very Good	6. Patching	13. Shrinkage Crack
87- 100	Excellent	7. Patching/Utility Cut	14. Spalling-Joints

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Eastern Parking area in Heeb's Market, just west of concrete sidewalk
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 1,260 sq. ft.

Type of Distress Observed	Severity	Quantity
8	Low	15
3	Low	4
6	Low	30 Lf.
PCI = 80	Rating: Very Good	

PCI	RATING SCALE
0-31	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good

DISTRESS TYPES

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
6. Longitudinal/Transverse Cracking
8. Patching
9. Polished Aggregate
10. Raveling/Weathering
11. Rutting
12. Shoving

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: East end of Alley behind Heeb's Market.
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 246.5 sq. ft.

Type of Distress Observed	Severity	Quantity
None Observed		
PCI = 100	Rating: Excellent	

PCI	RATING SCALE	DISTRESS TYPES	
0-32	Failed	1. Alligator Cracking	8. Patching
11-25	Very Poor	2. Bleeding	9. Polished Aggregate
26-40	Poor	3. Block Cracking	10. Raveling/Weathering
41-56	Fair	4. Corrugation	11. Rutting
57-70	Good	5. Depression	12. Shoving

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR ASPHALT PAVEMENT

Location: Entrance to Babcock apartments from alley behind Heeb's.
Number of Sample Units in Section: 1
Number of Sample Units Assessed: 1
Total Area Represented: 405 sq. ft.

Type of Distress Observed	Severity	Quantity
10	Low	405 sq. ft.
6	Low	27 lin. Ft.
PCI = 66	Rating: Good	

PCI	RATING SCALE	DISTRESS TYPES	
0-33	Failed	1. Alligator Cracking	8. Patching
11-25	Very Poor	2. Bleeding	9. Polished Aggregate
26-40	Poor	3. Block Cracking	10. Raveling/Weathering
41-56	Fair	4. Corrugation	11. Rutting
57-70	Good	6. Longitudinal Cracking	12. Shoving

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: 4-foot wide concrete slab along entire south side of Heeb's.

Number of Sample Units in Section: 10
Number of Sample Units Assessed: 10
Total Area Represented: 680 sf

Type of Distress Observed	Severity	Quantity
3	Low	41 lf
PCI = 80	Rating: Very Good	

Location: Concrete curb west of Wallace Ave. extending between alley and entrance to Heeb's.

Number of Sample Units in Section: 7
Number of Sample Units Assessed: 7
Total Area Represented: 75.6 lineal feet of curb

Type of Distress Observed	Severity	Quantity
14	Low	2 lengths
PCI = 92	Rating: Excellent	

PCI	RATING SCALE
0-34	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-104	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints

PCI ASSESSMENT SUMMARY

INDIVIDUAL SAMPLE UNIT FOR
PORTLAND CEMENT CONCRETE

Location: Residential Concrete Driveway south of alley behind Heeb's Market and just west of Wallace Ave.
Number of Sample Units in Section: 3
Number of Sample Units Assessed: 3
Total Area Represented: 540 sqft

Type of Distress Observed	Severity	Quantity
5	Low	31lf
3	Low	34lf
3	Medium	48lf
PCI = 30	Rating: Poor	

Location: Residential Concrete Driveway south of alley behind Heeb's Market, approximately 100 feet west of Wallace Ave.
Number of Sample Units in Section: 3
Number of Sample Units Assessed: 3
Total Area Represented: 3 Entrance sidewalks

Type of Distress Observed	Severity	Quantity
3	Medium	50 lf
PCI = 42	Rating: Fair	

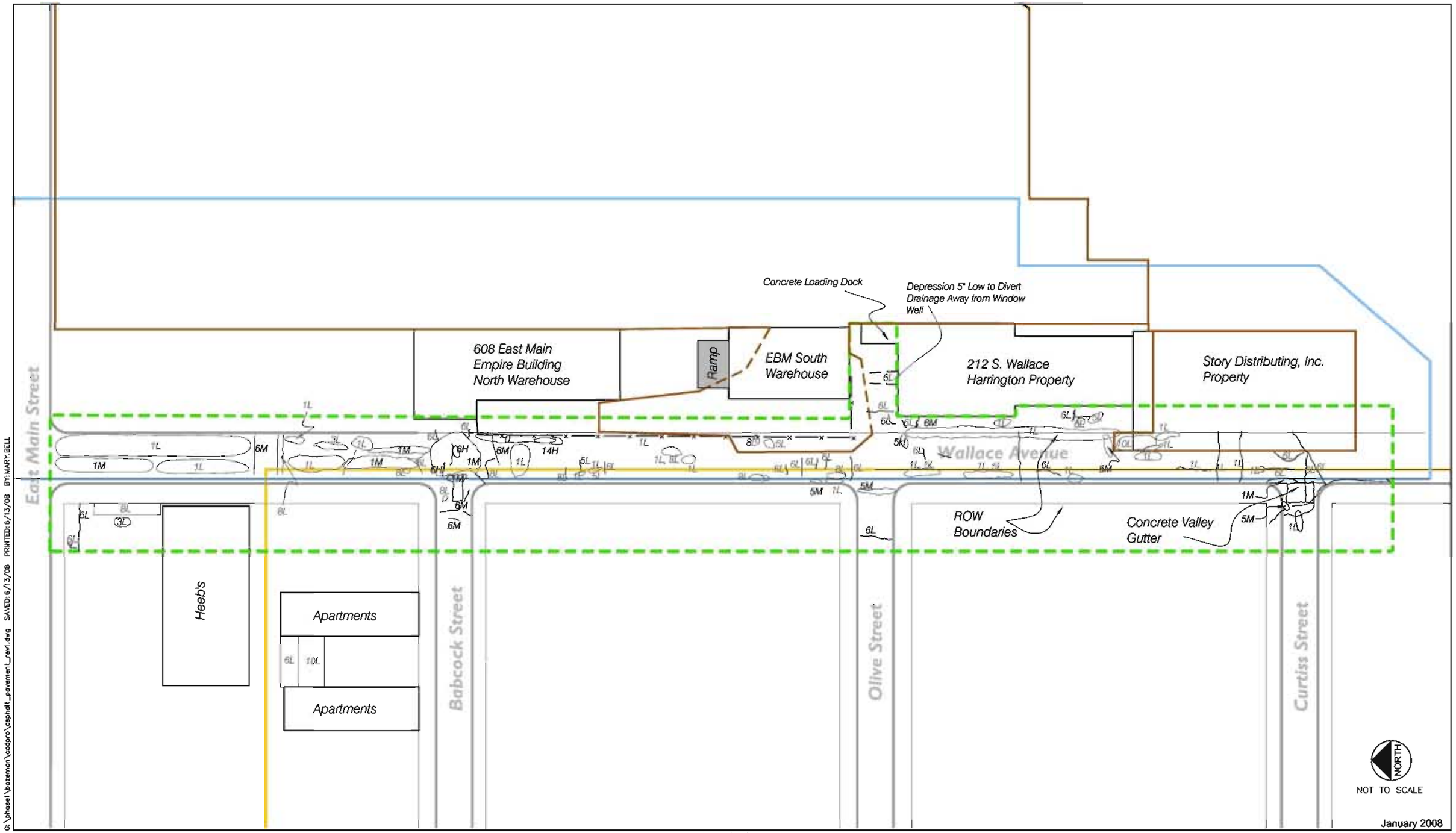
PCI	RATING SCALE
0-35	Failed
11-25	Very Poor
26-40	Poor
41-56	Fair
57-70	Good
71-105	Very Good
87- 100	Excellent

DISTRESS TYPES

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking
11. Settlement
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints

TETRA TECH

ATTACHMENT B:
Figure 1: Distress Type And Severity Level



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7720035.100

- Previously Assessed Area
- Proposed Pavement Assessment Area
- Sewer Main - PVC Pipe
- Sewer Main - Clay Pipe
- Water Main - Cast Iron Pipe
- Water Main - Ductile Pipe

Asphalt Distress Type:

1 - Alligator Cracking
3 - Block Cracking
5 - Depression
6 - Longitudinal & Transverse Cracking
8 - Patching
14 - Swell
10 - Ravelling & Weathering

Severity Level:

L - Low
M - Medium
H - High

Asphalt Pavement
CMC Bozeman Facility
Bozeman, Montana
FIGURE 1

TETRA TECH

ATTACHMENT C:
Survey Data Sheets and Field Notes

UNIT = Entrance to Balcock Apartments from Alley behind Heebs

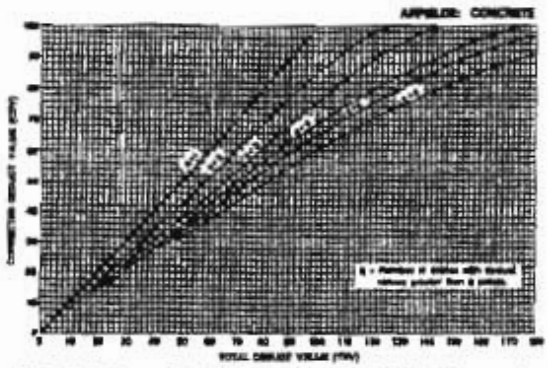


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

SKETCH: Apartment ← Asphalt Section

BRANCH _____ SECTION _____ SAMPLE UNIT _____

SURVEYED BY MF DATE 6/12/08 SAMPLE AREA 405

Heebs

1. Alligator Cracking	5. Depression	9. Oil Spillage	13. Rutting
2. Bleeding	6. Jet Blast	10. Patching	14. Shoving from PCC
3. Block Cracking	7. Jt. Reflection (PCC)	11. Polished Aggregate	15. Slippage Cracking
4. Corrugation	8. Long. & Trans. Cracking	12. Raveling/Weathering	16. Swell

DISTRESS SEVERITY	QUANTITY										TOTAL	DENSITY %	DEDUCT VALUE
12L	405										405	100	28
BL	27										27	67	19

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

CDV

28 17 — q=2 28

28 5 — 33 q=1 → 34

PCI = 66 = Good Condition

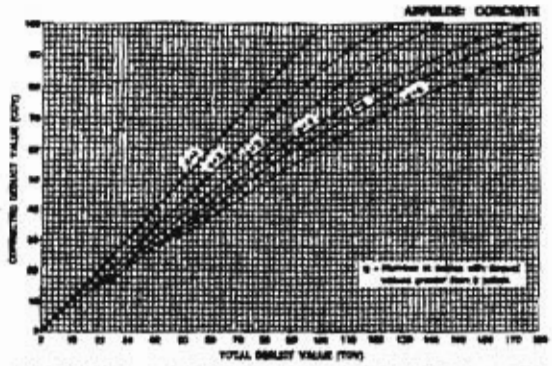


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

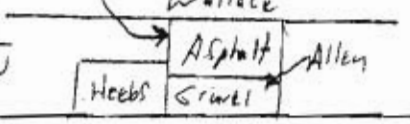
X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

Unit = Asphalt Section at East End of Alley.

AIRFIELD ASPHALT PAVEMENT
CONDITION SURVEY DATA SHEET
FOR SAMPLE UNIT

SKETCH:



BRANCH _____ SECTION _____ SAMPLE UNIT _____
SURVEYED BY ME DATE 6/12/08 SAMPLE AREA 246.5

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY										TOTAL	DENSITY %	DEDUCT VALUE

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

No Distress Observed

PCI = 100

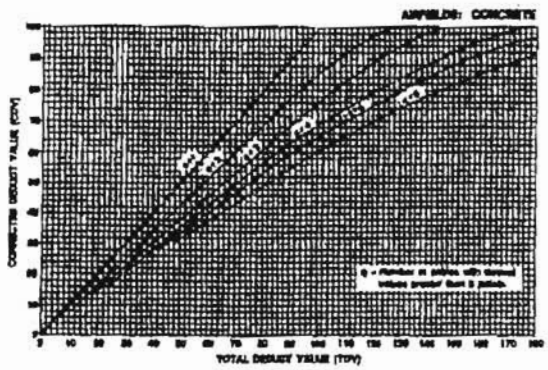


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2. Parking Area in East Hobbs Lot Adjacent to Wallace Ave

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH _____ SECTION _____ SAMPLE UNIT _____
SURVEYED BY MF DATE 6/12/08 SAMPLE AREA 12,660

SKETCH: Wallace — Main — 20' — 63' — Hobbs

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY										TOTAL	DENSITY %	DEDUCT VALUE
1 L	15										15	1.2	5
3 L	4										4	.32	5
8 L	30										30	2.4	8

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

Total 855 – 18 = 837 ÷ 9 = 93 (1) CDV 20

PCI = 80 : Very Good

Asphalt

[redacted]

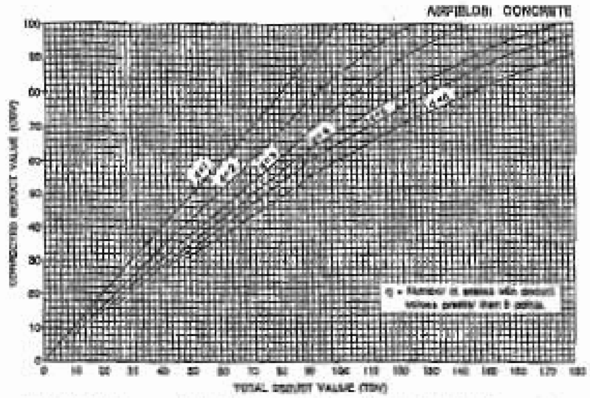


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

SKETCH: 8L, 5m, Olive, Wallace

BRANCH______ SECTION______ SAMPLE UNIT 4C
SURVEYED BY______ DATE______ SAMPLE AREA 45x50' 15x30

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY										TOTAL	DENSITY %	DEDUCT VALUE
8L	30										30	6.66	17
5m	60										60	13.33	40
~~12L~~	~~450~~										~~450~~		~~57~~

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

Deduct CDV
q=2 40 17 57 40
S2 q=1 40 5 45 42

PCI = 100 - 42 = 58 = Fair
40 to 56: Fair

Asphalt

30' x 357'

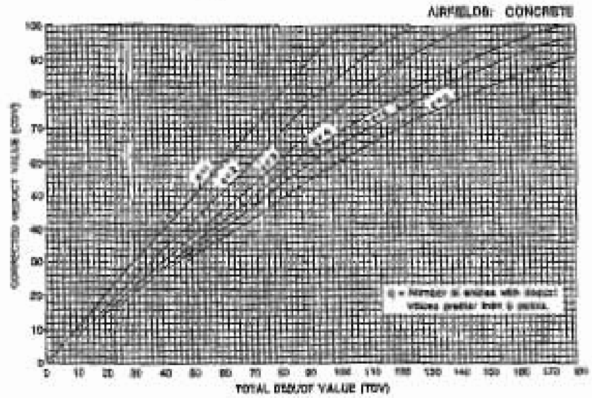


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

SKETCH:

BRANCH Wallace SECTION Owen's Bobcat SAMPLE UNIT AC
SURVEYED BY [illegible] DATE 12/19/[illegible] SAMPLE AREA 10710 sq ft

1. Alligator Cracking	5. Depression	9. Oil Spillage	13. Rutting
2. Bleeding	6. Jet Blast	10. Patching	14. Shoving from PCC
3. Block Cracking	7. Jt. Reflection (PCC)	11. Polished Aggregate	15. Slippage Cracking
4. Corrugation	8. Long. & Trans. Cracking	12. Raveling/Weathering	16. Swell

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE
~~10~~	~~[illegible]~~									~~[illegible] sq ft~~		
10L	39/10	30/160	90							329 sq	3.10	7.0
1L	20/20	160	80/50	450	290					1170 sq	10.9	15.0
8L	25/[illegible]	8/18/[illegible]								75 LF	0.7	4.5
5m	56									56 sq	0.52	10.0
5L	12	50								62 sq	0.58	3.0
1LH	60									60 sq	0.56	32.0
8m	25/12									37 LF	0.34	6.0
												77.5

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

CDV
40
40
44
46

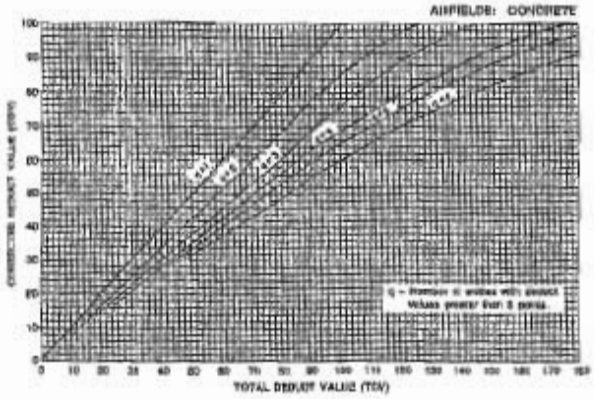


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT	SKETCH:
BRANCH_____ SECTION_____ SAMPLE UNIT AC-Parking SURVEYED BY_____ DATE_____ SAMPLE AREA 695 Sq Yds	

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE
1L	430	130 sq ft								695 sq yds	9.4	42
5L	20	20								400 sq ft	3.5	3.5
8L	25/30	16								615 sq ft	5.9	5.0
8M	16									160 sq ft	2.3	5.5
12L	685									Entire Area		56

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

A-C — Contrato To Olmo

Start 15' S of edge of Contrato
377' to edge of Olmo
130

Street
2" curb in curb
& AC Planing
30' wide

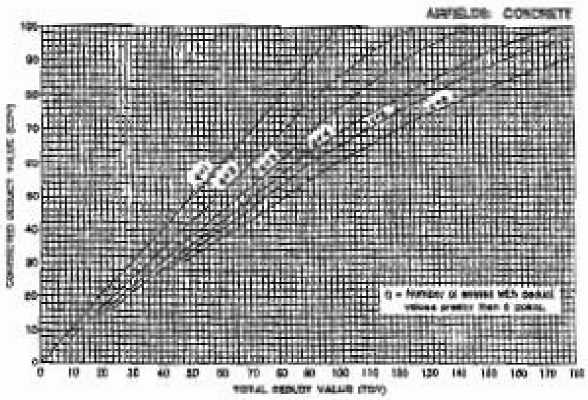


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

14
x4
56

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

SKETCH:

BRANCH Contrato to Olmo / Wallace Ave SECTION ______ SAMPLE UNIT AC Street

SURVEYED BY [illegible] DATE 12-18 SAMPLE AREA 11340 sq ft

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE	CDV
8L	71	18 [illegible]	27 [illegible]	10 30/32	9/15/16/16	32/28/[illegible]	56/C/18.0			282 LF	2.49	7.0	44
~~8M~~	~~16~~												
~~3L~~	~~8~~	~~10~~											
1L	56	8	10	16	[illegible]	10	120/130			658 sf	5.82	32.[illegible]	44
5L	16	2	30	16	8	[illegible]	180/160			260 sf	2.30	11.0	44
1M	40	16								56 sf	0.49	24.0	52
5H	5									5 sf	0.04	0.1	52
10L	252									252 sf	2.27	5.5	58
5M	32 sf									32 sf	0.28	7.0	
~~12L~~	~~1105 sq~~									~~1105 sq~~	~~9.77~~	~~25.0~~	
												97.6	

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

PCI = 100 - 58 = 42
~~40~~ Poor
46 fair
40 to 55 Fair

PCI Rating

AC Pavement

S. Side of [illegible] Street to S. Side of Olive Street

q = 7   CDV = ~~117.6~~ [illegible]

CDV = 54

									CDV		CDV
q = 7	38.0	[illegible]	[illegible]	[illegible]	7.0	7.0	[illegible]	[illegible]	= ~~117.6~~ 72.6	54	46
q = 6	38.0	25.0	24.0	11.0	7.0	7.0	5.0	0.1	~~117.1~~ 92.1	~~54~~	44
q = 5	38.0	25.0	24	11	7	5	5	0.1	~~115.1~~ 90.1	~~[illegible]~~	46
q = 4	38	25	24	11	5	5	5	0.1	~~113.1~~ 88.1	~~58~~	52
q = 3	38	25	24	5	5	5	5	0.1	~~107.1~~ 82.1	~~66~~	52
q = 2	38	25	5	5	5	5	5	0.1	~~88.1~~ 63.1	~~70~~	58
~~q = 1~~	~~38~~	~~5~~	~~5~~	~~5~~	~~5~~	~~5~~	~~5~~	~~0.1~~	~~68.1~~	~~64~~	

~~PCI = 100 - 64 = 36~~

PCI = 100 - 58 = 42 Fair

40 - 56 = Fair

[redacted] Asphalt ID# 7720035

15' Long x 35' wide

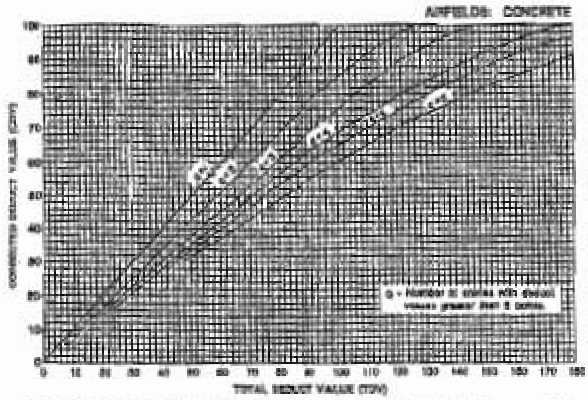


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

AC Paving: 10' x 35' = 350 sq'

Concrete Apron = 5 x 35' = 175 sq'

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

N?

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH Curtiss St SECTION Intersection Wallace SAMPLE UNIT AC Paving
SURVEYED BY [illegible] DATE 12-07 SAMPLE AREA 350 sf

SKETCH: Concrete apron; Curtiss St; Wallace Ave; 8'

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE
5M	4sf									4sf	1.14	15.0
3L	84sf									84sf	24.0	20.0
8L	14	7								21 LF	6.0	15.0
12L										~~35~~	~~10~~	~~27~~
												~~[illegible]~~
												50 DV

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

max CDV = 35.

PCI = 100-35=65

Rating = Good

[illegible] 56-70

AC Paving

Intersection of [illegible] Center [illegible] walkway

(15' of [illegible] [illegible] edge of walkway)

Area = 15x35 = 525 sf Total

AC Paving = 10x35 = 350 sf

Concrete = 5x35 = 175 sf Concrete

Pavement Condition Index (PCI) - Numerical Rating 0 to 100

Pavement Condition Rating - Verbal from "Failed" to "Excellent"

[illegible] of units to be inspected

$$n = \frac{N s^2}{\left(\frac{e^2}{4}\right)(N-1) + s^2}$$

e = acceptable error [illegible] PCI [illegible]

s = Standard deviation of the PCI; [illegible] for AC and 15 for Concrete

N: total number of sample units

Calculating PCI for AC Pavement

Example of Center to Walkway (350 sf)

Distress	Quantity	Total	Density %	Deduct Value
[illegible]	4 sf	4 sf	1.14 %	15.0 [illegible]
[illegible]	84 sf	84 sf	24.0 %	20.0 [illegible]
[illegible]	21 [illegible]	21 [illegible]	6.0 %	15.0 [illegible]
[illegible]	[illegible] sf	[illegible] sf	100 %	27.0 [illegible]

[illegible] ~~[illegible]~~ 50 ~~67~~

q = 3

m = 1 + (9/95)(100 - 27.0) = 7.92

q = 4

~~q=4 CDV [illegible] 40~~

q = 3 CDV = 50, 25

q = 2 CDV 45, 28

q = 1 CDV 30, 35

Max CDV = 35

Avg. [illegible] - [illegible] CDV

PCI [illegible] 100 - 35 = 65

Rating = Good

PCI ~~[illegible]~~ 56-70 is good

Rating 65

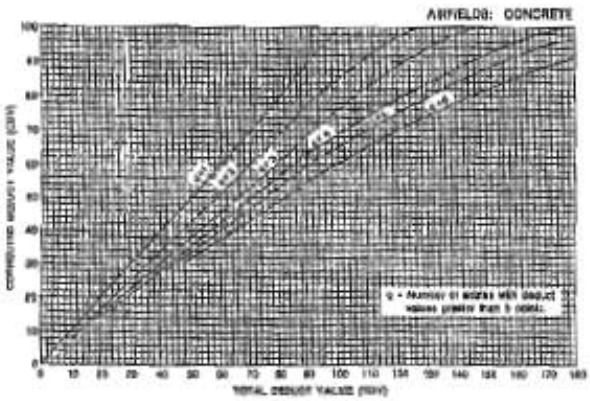


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT
CONDITION SURVEY DATA SHEET
FOR SAMPLE UNIT

SKETCH:

BRANCH _____ SECTION _____ SAMPLE UNIT _____
SURVEYED BY _____ DATE _____ SAMPLE AREA _____

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY								TOTAL	DENSITY %	DEDUCT VALUE

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

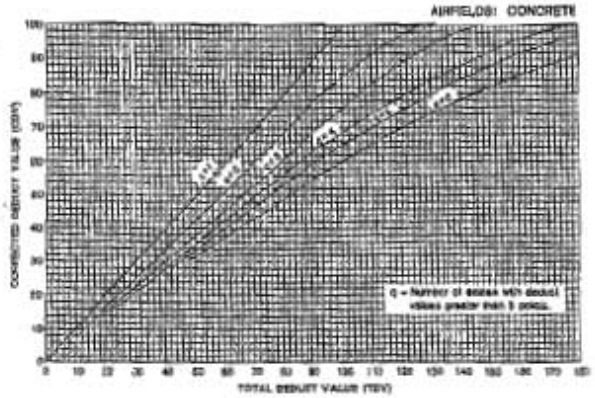


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT	SKETCH:
BRANCH _____ SECTION _____ SAMPLE UNIT _____ SURVEYED BY _____ DATE _____ SAMPLE AREA 3306	

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Corrugation
5. Depression
6. Jet Blast
7. Jt. Reflection (PCC)
8. Long. & Trans. Cracking
9. Oil Spillage
10. Patching
11. Polished Aggregate
12. Raveling/Weathering
13. Rutting
14. Shoving from PCC
15. Slippage Cracking
16. Swell

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE
DL	M									3306		
SH	225									225	6.8	45.0
BL	VS	25								40	1.21	5.0
												SDV

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

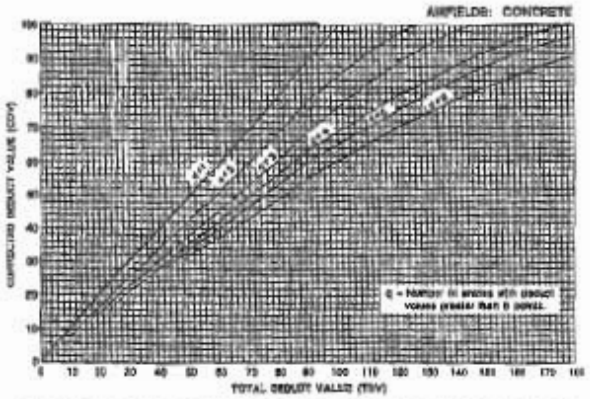


FIG. X4.16 Corrected DVs for Jointed Rigid Airfield Pavements

X5. BLANK FORMS

X5.1 See Figs. X5.1 and X5.2.

AIRFIELD ASPHALT PAVEMENT
CONDITION SURVEY DATA SHEET
FOR SAMPLE UNIT

SKETCH:

BRANCH Wallace SECTION _____ SAMPLE UNIT _____
SURVEYED BY _____ DATE 12/A/67 SAMPLE AREA 450

1. Alligator Cracking	5. Depression	9. Oil Spillage	13. Rutting
2. Bleeding	6. Jet Blast	10. Patching	14. Shoving from PCC
3. Block Cracking	7. Jt. Reflection (PCC)	11. Polished Aggregate	15. Slippage Cracking
4. Corrugation	8. Long. & Trans. Cracking	12. Raveling/Weathering	16. Swell

DISTRESS SEVERITY	QUANTITY										TOTAL	DENSITY %	DEDUCT VALUE
~~H/L~~													
M/L	200 Sq Yd										210	46.7	30.1
H M	816	Ft									36	7.1	30.1

FIG. X5.1 Flexible Pavement Condition Survey Data Sheet for Sample Unit

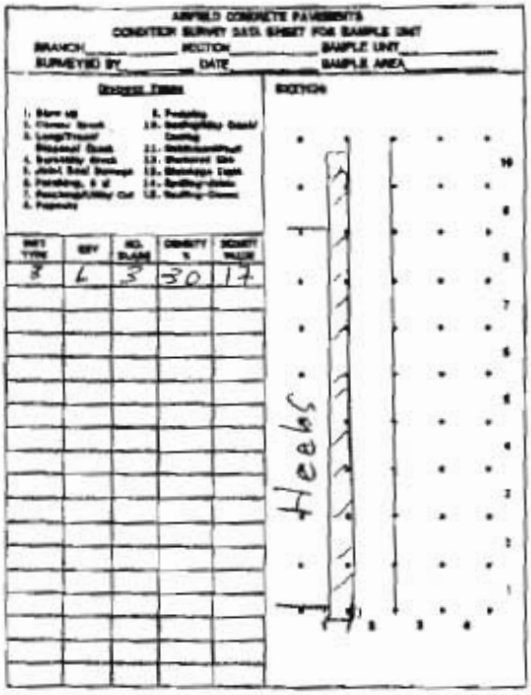


FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

4' x 170' Concrete Paved Section Along Backside (South) of Heads.
Estimate = 10 Slabs.

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System. Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Portion Friction Surfaces," *Technical Report No. M-151*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "Unusual Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

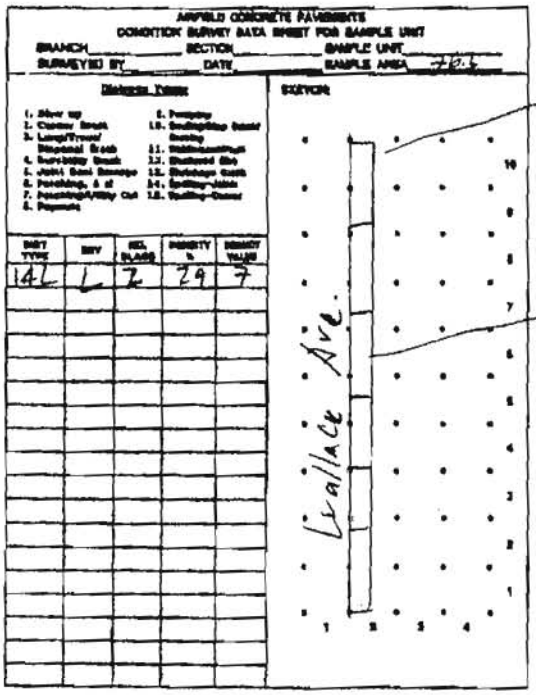
(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Total

→ 17 q=1 → CDV = 20

PCI = EC = Very Good

Concrete Curb Along Wallace Ave.



76.5 ft2

7 Total Lengths/Slabs

7 q=1 CDV=8

PCI=92
=Excellent

FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System. Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Paved Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

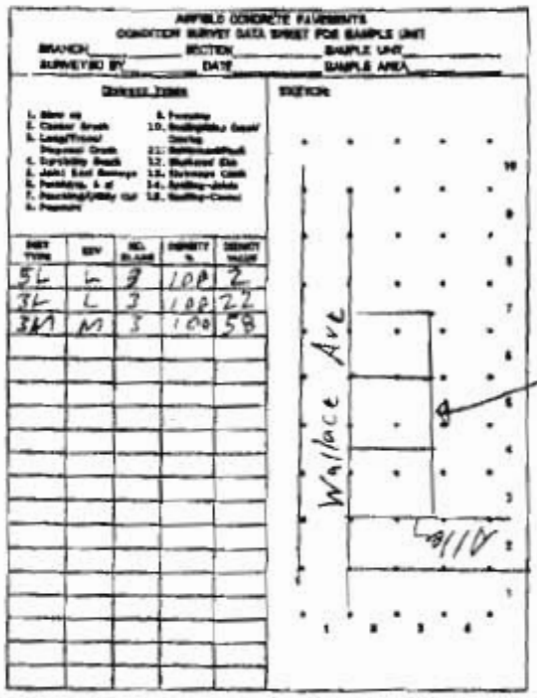
(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Concrete Driveway



SLAB TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE
SL	L	3	100	2
SL	L	3	100	22
SL	M	3	100	58

3 Total Large Slabs = 15.6' x 11.5' Each

FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

B

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Hickman, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

			Total		CDV
58	22	2 →	82	q=2	70 ← Max
58	5	2 →	65	q=1	65

PCI = 30 = POOR

Concrete Driveway

FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System. Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/1, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Total Q = CDV

57 1 58

PCI = 42 = FAIR

AIRFIELD CONCRETE PAVEMENTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH _____ SECTION _____ SAMPLE UNIT _____
SURVEYED BY _____ DATE _____ SAMPLE AREA _____

Distress Types

1. Blow up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching, S or
7. Polishing/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Crack/Crazing
11. Settlement/Fault
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE

SKETCH:

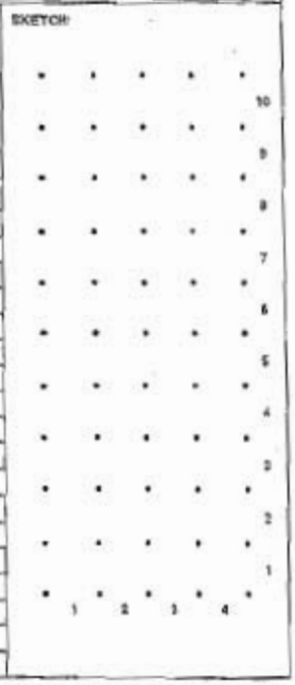


FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

AIRFIELD CONCRETE PAVEMENTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH _____ SECTION _____ SAMPLE UNIT _____
SURVEYED BY _____ DATE _____ SAMPLE AREA _____

Distress Types

1. Blow up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Faulting, ft in
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Cracking/Crazing
11. Settlement/Heave
12. Shattered Slab
13. Shrinkage Cracks
14. Spalling-Joints
15. Spalling-Corner

SKETCH:

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE

FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5. *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Concrete

AIRFIELD CONCRETE PAVEMENTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH ________ SECTION ________ SAMPLE UNIT ________
SURVEYED BY ________ DATE ________ SAMPLE AREA ________

Distress Types

1. Blow Up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching, Small
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Crack/Crazing
11. Settlement/Fault
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joint
15. Spalling-Corner

SKETCH:

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE

FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*. US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*. US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5. *Airfield Pavement Evaluation Program*. Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

X [illegible] side of [illegible]
Conc: X Cont Radius [illegible] side of Cen[illegible] Road. PCI = 100 Excellent
X Conc: 145' N of [illegible] 2 entrance apron PCI = 50 Fair
[illegible] X N side of apron + [illegible] PCI 90 Excellent
X [illegible] Cont Radius [illegible] PCI 7[illegible] Good
X NW cont Radius [illegible] PCI 1[illegible] Very Poor
X Conc: o line to Babcock PCI 44 Fair

Cont: [illegible] Crack from [illegible] to [illegible] [illegible] of
S. [illegible] of [illegible] - General Moore [illegible]

w side of Wallace
~~Crack Radiu[illegible] on W NS side of Center [illegible] [illegible]~~
~~Crack from [illegible] 100' [illegible] [illegible]~~
~~Assume 25 Sections [illegible]~~

Spalling [illegible] NS = 5 Sections   Density 83   DV   CDV
10 m = 5   83%   50   50

9 = 50

PCI = 100 - 50 = 50 Fair

Crack N side of [illegible] to Olive [illegible] [illegible] PCI 90

Cont: SW Radius of Olive   Density 100%   DV 30   CDV
PCI - 100 - 30 = 70   Good

Crack NW Radius of Olive - PCI = 100 - 82 = 18 Very Poor
10 H

Olive to Babcock   Assume 12 Sections

		Density %	DV	CDV
10L	8	67	15	
10m	2	17	20	
10H	3	25	46	
			81	

				DV	CDV
q(3)	46	20	15	81	50
(2)	46	20	5	71	46
(1)	46	5	5	56	56

PCI = 100 - 56 = 44 Fair

AIRFIELD CONCRETE PAVEMENTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH _____ SECTION _____ SAMPLE UNIT _____
SURVEYED BY _____ DATE _____ SAMPLE AREA _____

Distress Types

1. Blow up
2. Corner Break
3. Long/Trans/Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching, L & T
7. Pumping/Water Bleeding
8. Popouts
9. Punchouts
10. Scaling/Map Cracking
11. Settlement/Faulting
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joints
15. Spalling-Corner

SKETCH:

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE
3L		2	30	2
3m		1	15	5
10L		3	45	7
11m		2	91	8
				18

FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Concrete

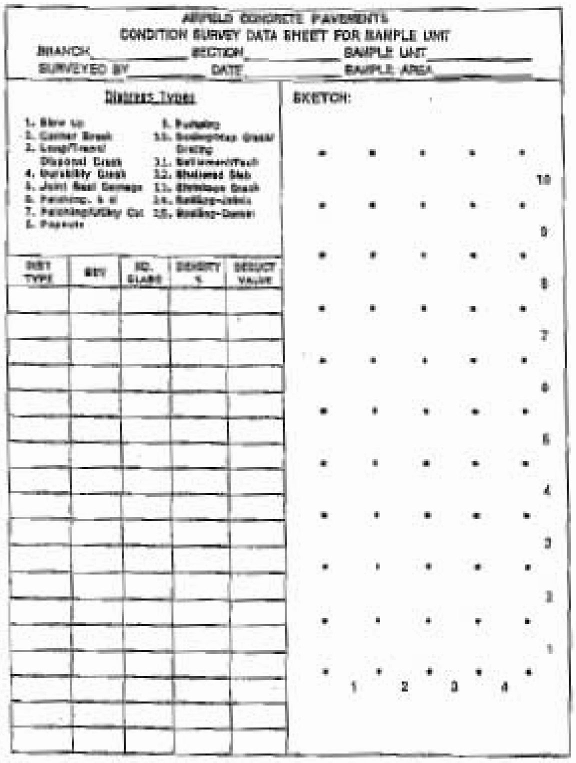


FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Side walk — W side · 17th ?? Section of walk · N of Olive PCI = 55 Fair

Section ... 5' Length

Sect 23-38 PCI 95 Excellent

Sect 39-49 PCI · 0 Failed

Sect 49-55 PCI · 100 Excellent

Sect 56-67 PCI 66 Good

Olive to Bankhead

		Density %	OV
3L	11	18.2	13
10L	11	[illegible]	8
7L	1	4.5	6
10H	2	9.1	25

~~3L 11~~
10L 11
7M
7L
2

[illegible] 1st [illegible] Section [illegible] N from Olive

Overall Condition [illegible]

					OV	CDV
9(4)	25	13	8	6	52	26
9(3)	25	13	8	5	51	34
9(2)	25	13	5	5	48	24
9(1)	25	5	5	[illegible]	40	25

~~PCI [illegible] 45 [illegible]~~
~~40 [illegible] Fair~~

~~15 [illegible] 23-3 [illegible]~~

7L 1 Density = 6.7% OV 5

~~PCI [illegible] = 95 [illegible] Excellent~~
86-100

39-44
Fern [illegible] 35' N [illegible] Highly deteriorated [illegible]
7 [illegible] of 10H ~~[illegible]~~
~~PCI = 0~~

~~[illegible]~~
~~49 [illegible] 55 [illegible]~~
0/6 % Density 0%
~~PCI = 100 [illegible]~~
86-100

56-61

		Density	OV	CDV	CDV
3L	2	16.7	13	38	18

12 [illegible]

	OV	CDV
9(2)	46	34
9(1)	33	34

~~[illegible]~~
10L - 67 [illegible] 15 - 18 18

~~PCI [illegible] - 34 = 66 Good~~
~~[illegible]~~

Concrete

[redacted]

AIRFIELD CONCRETE PAVEMENTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH________ SECTION________ SAMPLE UNIT________
SURVEYED BY________ DATE________ SAMPLE AREA________

Distress Types

1. Blow up
2. Corner Break
3. Long/Trans/ Diagonal Crack
4. Durability Crack
5. Joint Seal Damage
6. Patching, ≤ 5 sf
7. Patching/Utility Cut
8. Popouts
9. Pumping
10. Scaling/Map Crack/ Crazing
11. Settlement/Fault
12. Shattered Slab
13. Shrinkage Crack
14. Spalling-Joint
15. Spalling-Corner

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE

SKETCH:

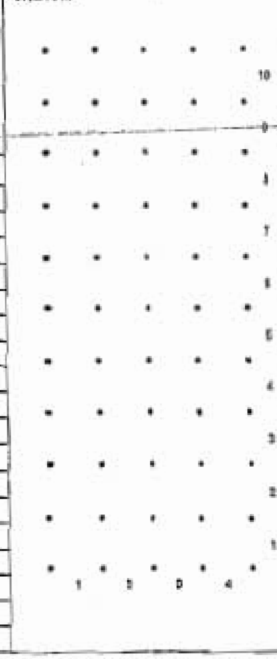


FIG. X5.2 Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit

REFERENCES

(1) Shahin, M. Y., Darter, M. I., and Kohn, S. D., "Development of a Pavement Maintenance Management System, Vol I, II, V," *Airfield Pavement Condition Rating*, US Air Force Civil Engineering Center, 1976.

(2) Kohn, S. D., and Shahin, M. Y., "Evolution of the Pavement Condition Index for Use on Porous Friction Surfaces," *Technical Report No. M-351*, US Army Construction Engineering Research Laboratory, Champaign, IL, 1984.

(3) Air Force Regulation 93-5, *Airfield Pavement Evaluation Program*, Department of the Air Force, Headquarters US Air Force, Washington, D.C.

(4) Advisory Circular No: 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, Federal Aviation Administration, US Department of Transportation.

(5) U.S. Naval Facilities Engineering Command Military Handbook 1021/2, "General Concepts for Airfield Pavement Design," 1988.

(6) *Pavement Condition Index (PCI) Field Manuals for Asphalt Surfaced Airfields*, American Public Works Association.

(7) *Pavement Condition Index (PCI) Field Manuals for Concrete Surfaced Airfields*, American Public Works Association.

(8) Green, W. H., and Eckrose, R. A., "Airport Pavement Inspection by PCI," 2nd edition, Eckrose/Green Associates, Madison, WI, 1988.

Crosswalk: 2 sections; N of Bedrock to S.E. Corner of Heeb's Market
PCI = 70 Good

Walk @ E end of Heeb's PCI = 32 Poor

Walk N of Heeb's AVE Comm. & Ecommerce System PCI = 42 Fair

[illegible] Section [illegible] 1 Alley (S [illegible] of [illegible])

		Density	DV	CDV
10L	[illegible] (19)	6.6	14	
3L	IIII	17.2	13	

				DV	
48	14	15		30	16
48	14	5		19	22

29 Total Section

PCI = 100-30 = 70 Good

(680 sq)

Sidewalk E end of Heck's Market (11' x 65')
(assume 3 - 20' sections)

		Density	DV	CDV
7L	1	300	15	
11H	1	300	20	
3m	3	100	53	
3L	3	100	22	
			110	

					DV	CDV
g (4)	53	22	20	15	110	59
(3)	53	22	20	5	100	56
(2)	53	22	5	5	85	58
(1)	53	5	5	5	68	68

PCI = 100 - 68 = 32 Poor

W end of Heck's Entrance Apron
(assume 1 Section)

		Density	DV	CDV
3L	1	100	58	58

PCI = 100 - 58 = 42 = Fair

[illegible] end of Entrance Apron at E. [illegible] — Nailed Excellent
PCI 100

7RA035

to Olive Street

Centre Street (15' S of Center S side to S side of Olive)

15'
05'
32
376' of AC Pavement X 35' wide

S. Side Olive to S Side of [illegible]

55
185
37
92
361' of AC Pavement X 35' wide

S side of [illegible] to S [illegible] of E. Main

35
143
16
60
24
51
337' of AC Pavement

North (South) Good (Section) 10

100'

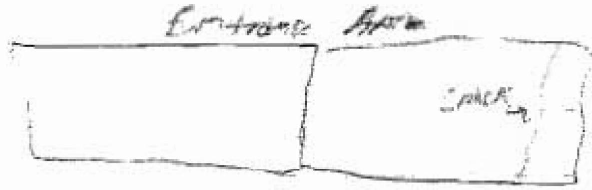
Sidewalk W side of Centre to Olive
5' Wide x 5' (30 Sections) Very good

3 sidewalk at 25'

Entrance Apron - 5 section 5 x 5

[4th] [5th] Slab from S end at Entrance Apron
Edge crack 1' Long + cut
6" long at Fork

Entrance Apron
7' W x 10' Long (2) S. Slab ok
N Slab - Medium Sev. Transverse Crack 7' Long



145'

W. side

Sidewalk from Entrance Apron to Olive
(29) Sections 5 x 5'
Section 1 - Just N of Entrance Apron - Very good
#2 [ ] 4'-5' Crack Med.
3, 4, 5 Exposed agg (Polished) Med
Slab 5 to 6 E [6/5] Slab 6 is 3/4" to 1" Higher

No. 6 + 14 Very Good
No 14 to 15 3/4 [15/14] 1" Slab 15 is 3/4 to 1" Higher

No. 16 Very Good
No. 16 & 17 - No. 16 3/4" Higher
No. 17 - 29 - Older Sidewalk but good condition

S

Replace 330' of Sidewalk 5' x 5' Sections (66 Sections)

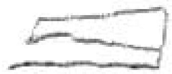
West Side Sidewalk Olive to Babcock

Sect. 1 4" x 6' 8" long Exposed Aggregate, Transverse crack 4"

Section [illegible] 4.5' [illegible]

Sect 2 Exposed Agg

No. 3 Long. Crack 5"



No. 4 " " 5"

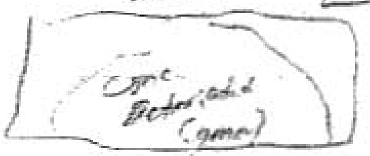
No. [illegible] " "

No. 5-18 Older but good condition

No. 19 @ 117 Wallace Patched

[illegible]

No. 20/21
~~[illegible]~~ 22 ok



High Sev.

No. 22 Low Severity patched

No. 23 - 38 Very Good

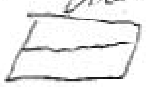
From Sect. 38 to (34-10") (45) [illegible] Single crack ~~[illegible]~~ ~~deteriorated~~ - High Severity
107 Wallace

No. 34 to End 5x5 Sections

From 107 Wallace Sect. 4' wide x 5'

39-45 Very Good

46, 47, 48 Older but Good - low Severity

49  5" Long. Crack Low to Med

No. 50  Transverse / Long Crack 4" ~~Transverse~~, 1" Long

51, 52, 53 Older but good - Low

54 Very Good

55, 56, 57 Older but good Low

W Side Babcock to E. Main

Side walk - Babcock to Alley S. of Hatch — 5x5 Sections

✓ No. 1, 2 older but Good

3, 4, 5, 6 - very Good 5'x5'

✓ #7 3'x5' older but good low

✓ #8 older but good 5x5

✓ #9, 10, 11 older Exposed Polished Agg - Not deteriorated

✓ #12 Same Condition but Transverse 5' Crack

✓ 13, 14, 15 Same - No Cracks - low

✓ 16-20 Older but good condition

Side walk at Entrance to Garage 7 section 5x5

✓ No. 21 [sketch] 3' Crack

✓ No. 22 [sketch] 5' Crack

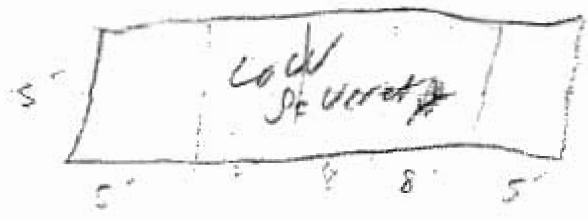
✓ No. 23 [sketch] 5' crack

✓ No. 24 [sketch] 2' Crack

✓ No. 25 ok

✓ No. 26 ok

Entrance Appr at Same location - to garage 5'x35'-7"



✓ Section Sidewalk @ alley - 15'-0" wide - Exposed Agg - Not low or deteriorated

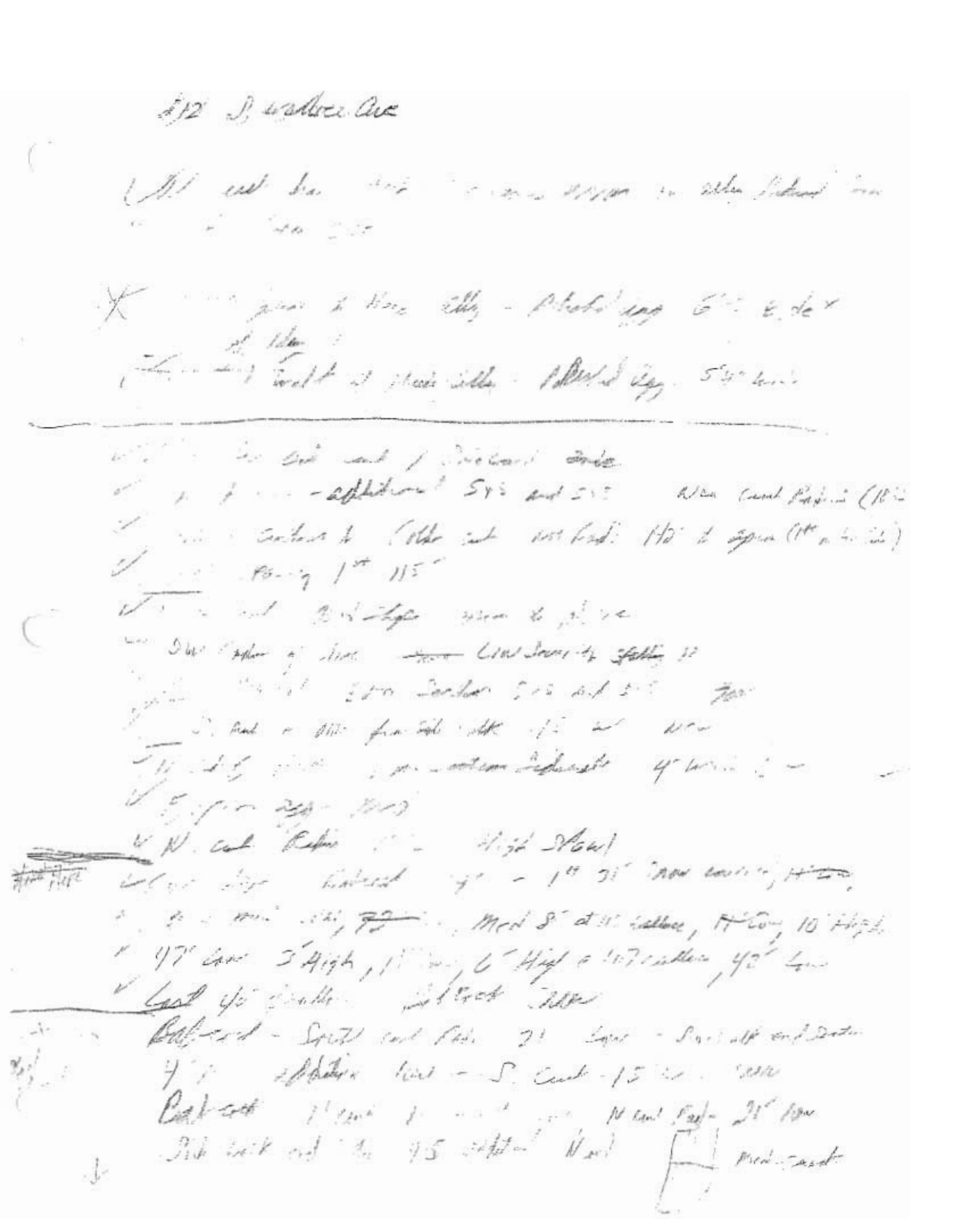
Entrance appr @ alley 5'x15' Exposed agg. Not deteriorated - 2"-3" crack 5' long at center of slab — med. Severity

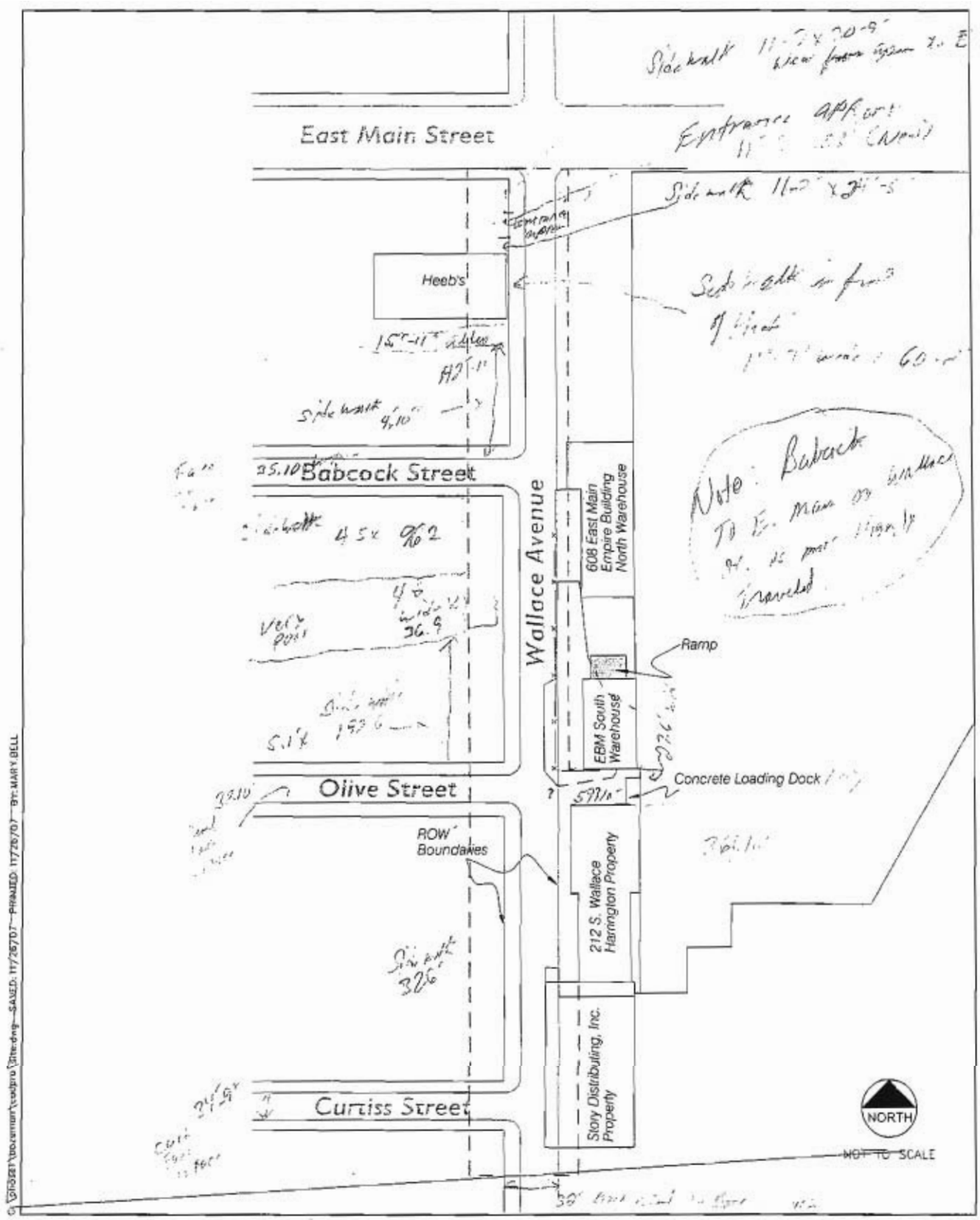
Sidewalk @ E. end of Hatch 11'-4" wide x 60' long

60' Crack about 1" wide Medium Severity

Side walk 3" high

512 S. Washington Ave





Previously Assessed Area

Proposed Pavement Assessment Area

7720035.100

Appendix A
Pavement Assessment
CMC Bozeman Facility
Bozeman, Montana
FIGURE 5

APPENDIX E

Test Pit Excavation Logs

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: Heebs TP-4

DESCRIPTIVE LOCATION: Approximately 80' from sidewalk, 15' from Heebs (LAT 45.6788514489° N, LON -111.029041031° E)

DATE STARTED: 12-20-07 DATE COMPLETED: 12-20-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3'

REMARKS: Approximately 0-1.5' depth visible ore. North side sample location.
Excavation collected using wet methods
0081 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Road mix dark brown with gravels and 5" minus with asbestos ore		
.5 – 1	Road mix dark brown with gravels and 5" minus with asbestos ore		
1 – 1.5	Road mix dark brown with gravels and 5" minus with asbestos ore		
1.5 – 2	Lean clay, dark gray		
2 – 2.5	Lean clay, dark gray		
2.5 – 3	Lean clay, dark gray		
	Lean clay, dark gray (Base)	3	
	Lean clay, dark gray (Base Duplicate)	3	
	Composite	1.5 - 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: Heebs TP-1

DESCRIPTIVE LOCATION: SW corner of Heebs building/NE corner (LAT 45.678866822° N, LON -111.028693326° E)

DATE STARTED: 12-20-07 DATE COMPLETED: 12-20-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3.0'

REMARKS: Start 0900, sample collected 0930
Visible ore present

0079 .jpg

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0-0.5	Brown road mix large cobbles with asbestos ore		
0.5 – 1.0	Brown road mix large cobbles with asbestos ore		
1.0 – 1.5	Brown road mix large cobbles with asbestos ore		
1.5 – 2.0	Brown clayey silt		
2 .0– 2.5	Brown clayey silt		
2.5 -3.0	Brown clayey silt		
3.0 base	Brown clayey silt		
	Composite	1.5 – 3.0	
	Base	3.0	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: Heebs TP-2

DESCRIPTIVE LOCATION: 15' from South of Heebs building, approximately 45 feet from sidewalk crossing alley (LAT 45.6788373286° N, LON -111.02884293° E)

DATE STARTED: 12-20-07 DATE COMPLETED: 12-20-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3.0'

REMARKS: Start 1020. End of 1120 for dig. South side wall samples collected. No visible ore present throughout test pit. Test pit at beyond edge of gravel alleyway along the south side. 0080. JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0-0.5	Road mix dark brown with gravel with 5" cobbles.		
0.5 – 1.0	Road mix dark brown with gravel with 5" cobbles. Interface @ 1"		
1.0 – 1.5	Dark Gray Fat Clay		
1.5 – 2.0	Dark Gray Fat Clay		
2 .0– 2.5	Dark Gray Fat Clay		
2.5 -3.0	Dark Gray Fat Clay		
	Dark Gray Fat Clay (Base)	3.0	
	Composite	0 – 3.0	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: Heebs TP-3

DESCRIPTIVE LOCATION: Approximately 60' from east sidewalk crossing alley (near Gas Main) and 3' from South side of Heebs building (LAT 45.6788693656° N, LON -111.028928438° E)

DATE STARTED: 12-20-07 DATE COMPLETED: 12-20-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3.0'

REMARKS: Approximately 0 – 1.5' depth visible ore present. North side of test pit in alley way for sample collection 0080 .jpg

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - 0.5	Road mix dark brown with gravels and 5" cobbles and asbestos ore		
0.5 – 1.0	Road mix dark brown with gravels and 5" cobbles and asbestos ore		
1.0 – 1.5	Dark gray with construction debris – some asbestos ore present		
1.5 – 2.0	Dark gray Lean clay		
2 .0– 2.5	Dark gray lean clay		
2.5 -3.0	Dark gray lean clay		
	Dark gray lean clay (Base)	3.0	
	Composite	1.5 – 3.0	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: Heebs TP-5

DESCRIPTIVE LOCATION: Approximately 100' from side walk, 3' from Heebs South building
(LAT 45.6788757327°N, LON-111.029192528° E)

DATE STARTED: 12-29-07 DATE COMPLETED: 12-29-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3'

REMARKS: 0-1.5' depth visible ore.
North side wall sample location.
Collected using wet methods
0082 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Road mix dark brown with gravels and 5" minus with asbestos ore		
.5 – 1	Road mix dark brown with gravels and 5" minus with asbestos ore		
1 – 1.5	Road mix dark brown with gravels and 5" minus with asbestos ore		
1.5 – 2	Lean clay, dark gray		
2 – 2.5	Lean clay, dark gray		
2.5 – 3	Lean clay, dark gray		
	Lean dark gray clay (Base)	3	
	Lean dark gray clay (Base Duplicate)	3	
	Composite	1.5 - 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: SHB TP-1

DESCRIPTIVE LOCATION: SHB North Test Pit against NHB north dock wall (LAT 45.6770607°N, LON -111.02806788°E)

DATE STARTED: 12-19-07 DATE COMPLETED: 12-19-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 4'

REMARKS: 1000 – start, 1005 called/left message with Susan Swimley and Tim Cooper.
* Small hole made in building from contractor
* done at 11:10 , put surface asbestos ore in the hole and buried
0084 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Poorly graded medium brown sand with gravels and cobble up to approximately 7"		
.5 – 1	Poorly graded medium brown sand with gravels and cobble up to approximately 7" with visible asbestos ore		
1 – 1.5	Poorly graded medium brown sand with gravels and cobble up to approximately 7" with visible asbestos ore		
1.5 – 2	Poorly graded medium brown sand with gravels and cobble up to approximately 7" with visible asbestos ore		
2 – 2.5	Poorly graded medium brown sand with gravels and cobble up to approximately 7" with visible asbestos ore		
2.5 – 3	Poorly graded medium brown sand with gravels and cobble up to approximately 7" with visible asbestos ore		
3.0 – 3.5	Poorly graded medium brown sand with gravels and cobble up to approximately 7" with visible asbestos ore		
3.5 – 4.0	Dark brown clayey silts (looks native) no/very little gravels		
	Dark brown clayey silts no/very little gravels (Base)	4.0	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: SHB TP-2

DESCRIPTIVE LOCATION: 20' South of SHB-TP1 (LAT 45.6769772981°N, LON -111.028038404°E)

DATE STARTED: 12-19-07 DATE COMPLETED: 12-19-07 EXCAVATION COMPANY ACM

TOTAL DEPTH

REMARKS: 11:15 1140 start testpit/backfilled
visible evidence of asbestos ore in excavation
Soil wet during excavation
0074 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	South side wall, 12" minus with sandy soil poorly graded sand with gravels non-native fill		
0.5 – 1	South side wall, 12" minus with sandy soil poorly graded sand with gravels non-native fill		
1 – 1.5	South side wall, 12" minus with sandy soil poorly graded sand with gravels non-native fill		
1.5 – 2.0	South side wall, 12" minus with sandy soil poorly graded sand with gravels non-native fill		
2.0 – 2.5	South side wall, 12" minus with sandy soil poorly graded sand with gravels non-native fill		
2.5 – 3.0	South side wall, 12" minus with sandy soil poorly graded sand with gravels non-native fill		
	Dark brown clayey silt (Base)	4	
	Composite	1 - 3	
	Duplicate of Composite	1 - 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: SHB TP-3

DESCRIPTIVE LOCATION: Approximately 40' South from NHB East dock (LAT 45.6769331529°N, LON -111.02804898°E)

DATE STARTED: 12-19-07 DATE COMPLETED: 12-19-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 2.5'

REMARKS: Started 1315 Finished Excavation with Backfill 1345
Wet Methods used during excavation
visible asbestos ore present 0-2.5'
0076 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	South side wall 10" – minus with sandy soil poorly graded sand with gravels – visible asbestos ore		
0.5 – 1	South side wall 10" – minus with sandy soil poorly graded sand with gravels – visible asbestos ore		
1.0 – 1.5	South side wall 10" – minus with sandy soil poorly graded sand with gravels – visible asbestos ore		
1.5 – 2.0	South side wall 10" – minus with sandy soil poorly graded sand with gravels – visible asbestos ore		
2.0 – 2.5	South side wall 10" – minus with sandy soil poorly graded sand with gravels – visible asbestos ore		
	Dark brown clayey silts (looks native) no/very little gravels (Base)	2.5	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: SHB – TP-4

DESCRIPTIVE LOCATION: 60' from South side of East NHB dock (towards City of Bozeman Library)
(LAT 45.6769370071°N, LON -111.028059846°E)

DATE STARTED: 12-19-07 DATE COMPLETED: 12-19-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 4'

REMARKS: Start 1400, stop 1430 (backfill)
South side wall samples
0075 .jpg

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Poorly graded sand with gravels and cobbles up to 10"		
.5 – 1	Poorly graded sand with gravels and cobbles up to 10"		
1 – 1.5	Poorly graded sand with gravels and cobbles up to 10"		
1.5 – 2	Poorly graded sand with gravels and cobbles up to 10"		
2 – 2.5	Poorly graded sand with gravels and cobbles up to 10"		
2.5 – 3	Poorly graded sand with gravels and cobbles up to 10"		
3 – 3.25	Visible asbestos ore present at interface		
	Dark brown clayey silts, little to no gravels (Base)	4	
	Composite	1 - 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: SHB TP-5

DESCRIPTIVE LOCATION: 80' South of East NHB Dock (LAT 45.6768204384°N, LON -111.028062503°E)

DATE STARTED: 12-19-07 DATE COMPLETED: 12-19-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 2.5''

REMARKS: Start 1445, stop 1520 (backfill)
Asbestos ore noted in test pit debris pile and at top of concrete footing of building

.0077 JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	South wall poorly graded sand with gravels and cobbles up to 10”		
.5 – 1	South wall poorly graded sand with gravels and cobbles up to 10”		
1 – 1.5	South wall poorly graded sand with gravels and cobbles up to 10”		
1.5 – 2	South wall poorly graded sand with gravels and cobbles up to 10”		
2 – 2.5	South wall poorly graded sand with gravels and cobbles up to 10”		
	Composite	0 – 2.5	
	Dark brown clayey silts little to no gravels (Base)	2.5	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/NS TEST PIT NO.: SHB TP-6

DESCRIPTIVE LOCATION: SHB SE corner of building (LAT 45.6767885903°N, LON -111.02805648°E)

DATE STARTED: 12-19-07 DATE COMPLETED: 12-19-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 2.5''

REMARKS: Start 1530, stop 1600
East side wall only 1' into boundary area visible ore present.

0078 Photo JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0.5 – 1	Visible ore mixed with poorly graded sand with gravels with 10" minus boulders with asbestos ore		
1 – 1.5	Visible ore mixed with poorly graded sand with gravels with 10" minus boulders.		
1.5 – 2	Visible ore mixed with poorly graded sand with gravels with 10" minus boulders.		
2 – 2.5	Visible ore mixed with poorly graded sand with gravels with 10" minus boulders.		
	Dark brown clayey silts – little to no gravels	2.5	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-1

DESCRIPTIVE LOCATION: Approximately 15' south of SE SHB building corner (LAT 45.6767530036°N, LON -111.028076108°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 4'

REMARKS: 1145 Start 1200 – backfilled at 1230

0084 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Duff layer with gravels, asbestos ore present		
.5 – 1	Gravels with sandy soils 6" minus , asbestos ore present		
1 – 1.5	Gravels with sandy soils 6" minus with cobbles, asbestos ore present		
1.5 – 2	Dark brown silty sand with gravels		
2 – 2.5	Dark brown silty sand with gravels		
2.5 – 3	Dark brown silty sand with gravels		
3.0 – 3.5	Sandy light brown silt with gravels		
3.5 – 4.0	Sandy light brown silt with gravels		
	Composite	1.5 -4.0	
	Sandy light brown silt with gravels (Base)	4.0	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-2

DESCRIPTIVE LOCATION: 20' from SE corner of Harrington S. Building., 15' S of SHB Building
(LAT 45.6767876614°N, LON -111.028156459°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 4'

REMARKS: 1225 – 1245, 1300 backfill
Excavation conducted using wet methods
0086 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Duff layer with gravels – visible asbestos ore		
.5 – 1	Sandy layer 6" minus cobbles – visible asbestos ore		
1 – 1.5	Sandy layer 6" minus cobbles– visible asbestos ore		
1.5 – 2	Sandy layer 6" minus cobbles– visible asbestos ore		
2 – 2.5	Sandy layer 6" minus cobbles– visible asbestos ore		
2.5 – 3	Old duff layer with gravels – visible asbestos ore		
3 – 3.5	Old duff layer with gravels – visible asbestos ore		
3.5 – 4	Light brown sandy silt with gravels		
	Light brown sandy silt with gravels (Base)	4	
	Composite	3.5 - 4	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-3

DESCRIPTIVE LOCATION: Approximately 40' W of SE corner of SHB (LAT 45.6767421395°N, LON -111.02823382°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3'

REMARKS: Start excavation 1200, 1215 excavation finished 1250 backfill
Wet methods used during excavation
Visual asbestos ore 0 - 1.5'
0085 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Duff with sandy gravels 6" minus cobbles, Asbestos ore present		
.5 – 1	Sandy gravels 6" minus cobbles, Asbestos ore present		
1 – 1.5	Sandy gravels 6" minus cobbles, Asbestos ore present		
1.5 – 2	Light brown sandy silt with gravels		
2 – 2.5	Light brown sandy silt with gravels		
2.5 – 3	Light brown sandy silt with gravels		
	Light brown sandy silt with gravels (Base)	3	
	Composite	1.5 – 3	
	Composite Duplicate	1.5 – 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-4

DESCRIPTIVE LOCATION: Near power pole on SW corner of SHB (LAT 45.6767887945°N, LON -111.028311668°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3'

REMARKS: Started 1315, 1345 Stop.
No visible asbestos ore
Excavation conducted using wet methods
0087 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Duff layer with gravels		
0.5 – 1	Sandy layer 6" minus with cobbles		
1.0 – 1.5	Sandy layer 6" minus with cobbles		
1.5 – 2.0	Dark brown silty sand		
2.0 – 2.5	Dark brown silty sand		
2.5 - 3.0	Light brown sandy silt with gravels		
	Light brown sandy silt with gravels	3	
	Composite	0 - 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-5

DESCRIPTIVE LOCATION: SW corner of SHB 15' from S and 20' W (LAT 45.6767546677°N, LON -111.028383626°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3'

REMARKS: Started 1700, finished 1725 Backfilled at 1820
No visible asbestos ore
Collected using wet methods
0089 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Sandy with gravels and 10" minus and cobbles		
0.5 – 1	Sandy with gravels and 10" minus and cobbles		
1.0 – 1.5	Sandy with gravels and 10" minus and cobbles		
1.5 – 2.0	Sandy with gravels and 10" minus and cobbles		
2.0 – 2.5	Dark brown clayey sand		
2.5 - 3.0	Light brown sandy silt with gravels		
	Light brown sandy silt with gravels (Base)	3	
	Composite	0 - 3	

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-6

DESCRIPTIVE LOCATION: 15' S, 40' W of SE corner of SHB (LAT 45.6767632555°N, LON -111.028466803°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH Excavation to 1.5'

REMARKS: Engineered Road Bed in same locale as previous test pit exploration and soil removal with encapsulation. Colleen Owen indicated to previous data from past excavations in area coupled with onsite reference of new asphalt indicates previous excavation in area of test pit.

0070 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 - .5	Engineered 1 1/2 " minus road base material with fines		
.5 – 1	Engineered 1 1/2 " minus road base material with fines		
1 – 1.5	Engineered 1 1/2 " minus road base material with fines		

TETRA TECH

FIELD LOG OF EXPLORATION TEST PIT

JOB NO: 1157720035.200 PROJECT NAME: CMC Bozeman Facility

STATE: MT COUNTY: Gallatin LOGGED BY: KC/RWE TEST PIT NO.: Story TP-7

DESCRIPTIVE LOCATION: 40' W of SW corner of SHB (LAT 45.6767977942°N, LON -111.028452715°E)

DATE STARTED: 12-28-07 DATE COMPLETED: 12-28-07 EXCAVATION COMPANY ACM

TOTAL DEPTH 3'

REMARKS: Start 1330. Finish 1630. No visible ore. Hard to dig into ground in this location as it had been compacted and frozen previously. Backhoe bucket could not scrap through. Rented Jackhammer, then rented bobcat with hydraulic jackhammer attachment to penetrate soil. Provided continuous wetting of soil throughout excavation.

0088 Picture JPG

Depth (feet)	Classification and Description	Sample Depth (ft)	Headspace (ppm)
0 – 0.5	1.5" graded road mix		
0.5 – 1.0	1.5" graded road mix		
1.0 – 1.5	1.5" graded road mix		
1.5 – 2.0	3' Minus cobbles with dark brown clayey sand.		
2.0 – 2.5	3' Minus cobbles with dark brown clayey sand.		
2.5 – 3.0	3' Minus cobbles with dark brown clayey sand.		
	Light brown sandy silts with gravels	3.0 Bottom	
	Composite	0 - 3.0	

APPENDIX F

Test Pit Photo Log with Location Descriptions and GPS coordinates

APPENDIX F: TEST PIT PHOTO LOG WITH LOCATION DESCRIPTIONS
CMC BOZEMAN FACILITY – SI WORKPLAN
CITY OF BOZEMAN

PHOTOGRAPH 1 SHB TP-1: Located in NE corner of SHB along NHB east dock area south wall

PHOTOGRAPH 2 SHB TP-2: Located 20 feet south of SHB TP-1 directly against east footing wall of SHB

PHOTOGRAPH 3 SHB TP-3: Located 40 feet south of SHB TP-1 directly against east footing wall of SHB

PHOTOGRAPH 4 SHB TP-5: Located 80 feet south of SHB TP-1 directly against east footing wall of SHB

PHOTOGRAPH 5 SHB TP-6: Located 95-100 feet south of SHB TP-1 in middle of soil berm next to SE SHB

PHOTOGRAPH 6 HEEBs TP-1: Located 4' south of Heebs and 12-14' from east alley sidewalk (past asphalt)

APPENDIX F: TEST PIT PHOTO LOG WITH LOCATION DESCRIPTIONS
CMC BOZEMAN FACILITY – SI WORKPLAN
CITY OF BOZEMAN

PHOTOGRAPH 7 HEEBs TP-2: Located 15' south of Heebs and 45' from east alley sidewalk

PHOTOGRAPH 8 HEEBs TP-3: Located 4' south of Heebs and 75' from east alley sidewalk

PHOTOGRAPH 9 HEEBs TP-4: Located 15' south of Heebs and 120' from east alley sidewalk near lightpole

PHOTOGRAPH 10 HEEBs TP-5: Located 4' south of Heebs and 160' from east alley sidewalk

PHOTOGRAPH 11 Story TP-1: Located 15' directly south of the SE corner of SHB

PHOTOGRAPH 12 Story TP-2: Located 20' directly west of the SE corner of SHB and adjacent to SHB

TETRA TECH

APPENDIX F: TEST PIT PHOTO LOG WITH LOCATION DESCRIPTIONS
CMC BOZEMAN FACILITY – SI WORKPLAN
CITY OF BOZEMAN

PHOTOGRAPH 13 Story TP-4: Located east of the light pole near the SW corner of the SHB and adjacent to SHB

PHOTOGRAPH 14 Story TP-5: Located 20' to the west of the SW corner of the SHB and 15' to the south of SHB

PHOTOGRAPH 15 Story TP-6: Located 40' to the west of the SW corner of the SHB (east of asphalt pavement) and 15' to the south of SHB

PHOTOGRAPH 16 SHB TP-7: Located 40' to the west of the SW corner of the SHB (east of the asphalt pavement)

APPENDIX G

Asbestos Waste Volume Calculations

TETRA TECH

CLIENT City of Bozeman DATE 6/11/08

JOB TITLE CMC Bozeman Facility - SI Work Plan JOB NUMBER 115 7720035.200

SUBJECT South Harrington Building Actual Asbestos Ore noted in Test Pits w/ volumes BY [illegible] SHEET 1 of 2

Waste Volume (Asbestos Ore) Calculations -

* Estimate of Asbestos Ore based on 12/19/07 Test Pit visual data
* Assume: 100 ft length x 7 ft width of Test Pit
* From Test Pit Log Data:
  - TP 1 = 3.5 ft depth visual asbestos ore
  - TP 2 = No visible asbestos ore detected in Test Pit
  - TP 3 = 1.5 ft depth visual asbestos ore
  - TP 4 = 3.25 ft depth visual asbestos ore
  - TP 5 = 2 ft depth @ top of SAB footing
  - TP 6 = 2.5 ft depth

TP1 to TP2

3.5 ft depth x 7 ft width x 20 ft length x $\frac{1}{2}$ (due to -0- depth @ TP2)

= 245 ft^3

TP2 to TP3

(-0- depth @ TP2) $\frac{1}{2}$ x 1.5 ft depth TP3 x 7 ft Width x 20 ft length

= 105 ft^3

TP3 to TP4

1.5 ft depth @ TP3 x 7 ft Width x 20 ft length + (3.25 depth @ TP4 - 1.5 depth @ TP3)

X 7 ft Width x 20 ft Length x .5 (due to -0- depth shown visible ore past 1.5 ft)

= 332.5 ft^3

TP4 to TP5

3.25 ft depth @ TP4 x 7 ft width x 20 ft length + (2.0 - 3.25 depth @ TP5 - depth @ TP4)

X 7 ft width x 20 ft length x .5 (due to -0- depth shown visible ore past 2.0 ft)

= 367.5 ft^3

TP5 to TP6

2.0 ft depth @ TP5 x 7 ft width x 20 ft length + (2.5 - 2.0 depth @ TP6 - depth @ TP5)

X 7 ft width X 20 foot length x .5 (due to -0- depth shown visible ore past 2.5 depth)

= 315 ft^3 total = 1365 ft^3 = 50.5 yd^3

TETRA TECH

CLIENT City of Bozeman DATE 6/11/08

JOB TITLE CMC Bozeman Facility - SI Work Plan JOB NUMBER 115772003S.200

SUBJECT SAB Theoretical Asbestos Ore noted in Test Pits w/ volumes BY [illegible] SHEET 2 of 2

* Estimate of Waste Volume Based on 12/19/07 Test Pit data using approximate 6 in over excavation.
* For TP-2, asbestos ore noted in excavation pile therefore assume until complete vertical depth
* ~~Assume: 100 ft length x 7 ft Width~~

From Test Pit Log Data w/ assumptions:

TP-1 = 4.0 ft depth
TP-2 = 3.0 ft depth
TP-3 = 2.0 ft depth
TP-4 = 4.0 ft depth
TP-5 = 2.5 ft depth
TP-6 = 3.0 ft depth

TP-1 to TP-2

4.0 ft depth @ TP-1 x 7 ft width x 20 ft length + (3.0 - 4.0 depth @ TP-2 - TP-1) x 7 ft x 20 ft x .5 (due to -0- depth shown past 3.0 ft)

= 490 ft³

TP-2 to TP-3

3.0 ft depth @ TP-2 x 7 ft width x 20 ft length + (2.0 - 3.0 ft depth @ TP3 - TP2) x 7 ft x 20 ft x .5 (due to -0- depth shown past 3.0 ft)

= 350 ft³

TP-3 to TP-4

2.0 ft depth @ TP-3 x 7 ft width x 20 ft length + (4.0 - 2.0 ft depth @ TP4 - TP3) x 7 ft x 20 ft x .5 (due to -0- depth shown past 20 ft)

= 420 ft³

TP-4 to TP-5

4.0 ft depth @ TP-4 x 7 ft width x 20 ft length + (2.5 - 4.0 ft depth @ TP-5 - TP-4) x 7 ft x 20 ft x .5 (due to -0- depth shown past 4.0 ft)

= 455 ft³

TP-5 to TP-6

2.5 ft depth @ TP-5 x 7 ft width x 20 ft length + (3.0 - 2.5 ft depth @ TP6 - TP5) x 7 ft x 20 ft x .5 (due to -0- depth shown past 2.5 ft)

= 385 ft³

Total = 2,100 ft³ = 78 yd³

TETRA TECH

CLIENT City of Bozeman DATE 6/14/08

JOB TITLE CMC Bozeman Facility - SI Work Plan JOB NUMBER 115772005.200

SUBJECT Heeb's Alley Actual Asbestos Ore Volume Test Pits BY [signature] SHEET 1 of 2

Waste Volume (Asbestos Ore) Calculations

* Estimate of asbestos ore based on 12/20/07 Test Pit visual data
* Assume 18 ft width of alley and 170 ft length of alley behind Heeb's structure minus 12 ft apron that is asphalt-paved on east side of alley
* Estimate based on vertical depth (horizontally) of 7 eng. 20 test pits

From Test Pit Log Data:

Heebs TP-1 : 0-1.5 ft visible asbestos ore
Heebs TP-2 : -0- ft visible asbestos ore
Heebs TP-3 : 0-1.5 ft visible asbestos ore
Heebs TP-4 : 0-1.5 ft visible asbestos ore
Heebs TP-5 : 0-1.5 ft visible asbestos ore

TP-1 to TP-2

1.5 ft depth @ TP-1 x 18 ft width x (45 ft length from sidewalk - 12 feet (asphalt) x .5 (due to -0- depth visible ore present past -0- depth @ TP-2)

= 607.5 ft³

TP-2 to TP-3

0 ft depth @ TP2 x 18 ft width x (75 ft @ TP3 - 45 ft @ TP-2) + (1.5 ft @ TP-3 - -0- ft @ TP2) x 18 ft width x (75 ft - 45 ft (TP3 - TP2)) x .5 (due to -0- depth visible ore past -0- depth @ TP-2)

= 405 ft³

TP3 - TP4

1.5 ft @ TP-3, TP-4 x 18 ft width x (120 ft - 75 ft (TP-4 - TP-3))

= 1215 ft³

TP-4 - TP-5

1.5 ft @ TP-4, TP-5 x 18 ft width x (160 ft - 120 ft (TP-5 - TP-4))

= 1080 ft³

Total = 3307.5 ft³ = 122.5 yd³

TETRA TECH

CLIENT City of Bozeman DATE 6/14/05

JOB TITLE CMC Bozeman Facility - ST Waste Plan JOB NUMBER 115772003S.200

SUBJECT Herb's Alley Theoretical Asbestos Ore BY [illegible] SHEET 2 of 2

noted in Alley Behind Herb's

* Estimate of Waste Volume Based on 12/19/04 Test Pit Data using approximate 6 in over excavation

* For TP-2 asbestos are noted in cracks of concrete driveway apron approx 2 to south therefore assume that randomly TP did not discover and/or see asbestos or; however it shall be shown to be removed @ 6 in past interface @ 2'

* Due to asbestos are in TP-1 @ interface of gravel/soil alley and east (12' asphalt (newly-paved) apron, assume asbestos are present beneath.

* Due to asbestos are in TP-5 @ -160' from side walk (east alley), assume asbestos are ~~extend~~ to entire 170' length of building using same visible Test Pit data

Therefore,

Assume 2' depth, 18' width, and 170' Length

Waste Volume =

$2' \times 18' \times 170'$

$= 6,120 ft^3 = \boxed{227 yd^3}$

TETRA TECH

CLIENT City of Bozeman DATE 6/16/08

JOB TITLE CMC Bozeman Facility - SI Work Plan JOB NUMBER 115772003S.200

SUBJECT Story Property Actual Asbestos Ore Noted in BY [illegible] SHEET 1 of 3

Waste Volume (Asbestos Ore) Calculations

- Estimate of asbestos ore based on 12/28/07 Test Pit visual data
- Assume 15 ft width and 100 ft length test area South of SHB
- Estimate based on vertical depth (horizontally) run of 'zig-zag' test pits

From Test Pit Log Data

Story TP-1 : 0 - 1.5 ft visible asbestos ore
Story TP-2 : 0 - 3.5 ft visible asbestos ore
Story TP-3 : 0 - 1.5 ft visible asbestos ore
Story TP-4 : -0- Asbestos ore noted
Story TP-5 : -0- Asbestos ore noted
Story TP-6 : -0- Asbestos ore noted
Story TP-7 : -0- Asbestos ore noted

TP-1 to TP-2

1.5 ft depth @ TP-1 x 15 ft width x 20 ft length + (3.5 - 1.5 (TP-2 - TP-1)) x 15 ft width x 20 ft length x .5 (due to -0- additional visible ore depth past 1.5 ft @ TP-1)

= 750 ft³

TP-2 to TP-3

3.5 ft depth @ TP-2 x 15 ft width x 20 ft length + (1.5 - 3.5 (TP-3 - TP-2)) x 15 ft width x 20 ft length x .5 (due to -0- additional visible ore depth past 1.5 ft @ TP-3)

= 750 ft³

TP-3 to TP-4

1.5 ft depth @ TP-3 x 15 ft width x 20 ft length + (0 - 1.5 (TP-4 - TP-3)) x 15 ft width x 20 ft length x .5 (due to -0- additional visible ore @ TP-4)

= 225 ft³

total = 1725 ft³ = 64 yd³

TETRA TECH

CLIENT City of Bozeman DATE 6/16/08

JOB TITLE CMC Bozeman Facility - SI Work Plan JOB NUMBER 115772003S.200

SUBJECT Story Theoretical Asbestos Ore noted on Property BY [illegible] SHEET 2 of 2

* Estimate of Work Volume Based on 12/19/07 Test Pit data using 6-inch over excavation

TP-1 to TP-2

2 ft depth @ TP-1 x 15 ft width x 20 ft length + (4.0 - 2.0 (TP-2 - TP-1)) x 15 ft width x 20 ft length x .5 (down to -0- additional visible ore depth past 2.0 ft @ TP-1)

= 900 ft^3

TP-2 to TP-3

4.0 ft depth @ TP-2 x 15 ft width x 20 ft length + (2.0 - 4.0 (TP-3 - TP-2)) x 15 ft width x 20 ft length x .5 (down to -0- additional visible ore depth past 2.0 ft @ TP-3)

= 900 ft^3

TP-3 to TP-4

2.0 ft depth @ TP-3 x 15 ft width x 20 ft length + (0 - 2.0 (TP-4 - TP-3) x 15 ft width x 20 ft length x .5 (down to -0- additional visible ore depth past -0-)

= 300 ft^3

total = 2,100 ft^3 = 78 yd^3

APPENDIX H

Soil Sample Analytical Laboratory Results

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontashlab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731709

EMSL Proj:
Analysis Date: 1/12/2008
Report Date: 1/15/2008

PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	Location	Appearance	% Fibrous	% Non-Fibrous	% Type
1-HEEBS-TP-1 *040731709-0001*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
2-HEEBS-TP-2 *040731709-0002*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
3-HEEBS-TP-2 *040731709-0003*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HEEBS-TP-3 *040731709-0004*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
5-HEEBS-TP-3 *040731709-0005*		Black Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
6-HEEBS-TP-4 *040731709-0006*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
7-HEEBS-TP-4 *040731709-0007*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
8-HEEBS-TP-5 *040731709-0008*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
9-HEEBS-TP-5 *040731709-0009*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
10-SHB-TP-1 *040731709-0010*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)
Delores Beard (18)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasplab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731709

EMSL Proj:
Analysis Date: 1/12/2008
Report Date: 1/15/2008

PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	Location	Appearance	% Fibrous	% Non-Fibrous	% Type
11-SHB-TP-2 *040731709-0011*		Black Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
12-SHB-TP-2 *040731709-0012*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
13-SHB-TP-3 *0731709-0013*		Black Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
-SHB-TP-4 *040731709-0014*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
15-SHB-TP-4 *040731709-0015*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
16-SHB-TP-5 *040731709-0016*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
17-SHB-TP-5 *040731709-0017*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
18-SHB-TP-6 *040731709-0018*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)

Delores Beard (18)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

EMSL Analytical, Inc.
107 Haddon Avenue, Westmont, NJ 08108 Phone: 800-220-3675 Fax: 856-858-4960

Client: Tetra Tech/Maxim Technologies
1601 2nd Avenue N Suite 116
Great Falls, MT 59401

Attention: Kenh Cron
Fax: email Phone:781-251-0040
Project: 1157720035.200 CMC BOZEMAN FACILITY - SI

EMSL Reference: 040800539

Date Received: 01/09/08
Date Analyzed: 01/18/08
Date Reported: 03/06/08

Asbestos Analysis of Soil Samples via Modified EPA 600/R-93/116 Method Utilizing Analytical Electron Microscopy (Section 2.5.5.2) with CARB 435 Prep (Milling) Level B for 0.1% Target Analytical Sensitivity

Client Sample ID	Location	EMSL Sample ID	Asbestos Type(s)	# of Asbestos Structures Detected	Analytical Sensitivity %	Asbestos Weight %	Comments
19-STORY-TP-1	COMPOSITE 1.5' -4'	040800539-0001	None Detected	None Detected	0.1	<0.1	
20-STORY-TP-1	BASE 4' DEPTH	040800539-0002	None Detected	None Detected	0.1	<0.1	
21-STORY-TP-2	3.5' -4' DEPTH	040800539-0003	Chrysotile	1	0.1	<0.1	
22-STORY-TP-2	4' - DEPTH	040800539-0004	None Detected	None Detected	0.1	<0.1	
23-STORY-TP-3	1.5' -3' COMPOSITE	040800539-0005	None Detected	None Detected	0.1	<0.1	
24-STORY-TP-3	3' DEPTH	040800539-0006	None Detected	None Detected	0.1	<0.1	
26-STORY-TP-4	0' -3' COMPOSITE	040800539-0007	None Detected	None Detected	0.1	<0.1	
27-STORY-TP-4	3' DEPTH	040800539-0008	None Detected	None Detected	0.1	<0.1	
28-STORY-TP-5	0 -3' COMPOSITE	040800539-0009	None Detected	None Detected	0.1	<0.1	
29-STORY-TP-5	3' DEPTH	040800539-0010	None Detected	None Detected	0.1	<0.1	
30-STORY-TP-7	0' -3' COMPOSITE	040800539-0011	None Detected	None Detected	0.1	<0.1	
31-STORY-TP-7	3' DEPTH (STORY TP-7)	040800539-0012	None Detected	None Detected	0.1	<0.1	

Debbie Little
Analyst

Stephen Siegel, CIH or Approved EMSL Signatory

EMSL maintains liability limited to cost of analysis. This method requires the laboratory to analyze the sample until the first fiber found compromises 5% of the total mass. Due to the size and mass of different asbestos fibers, the analytical sensitivity samples and may prevent the laboratory from achieving the target sensitivity on all samples. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL is not responsible for a activities or analytical method limitations. Interpretation and use of results are the responsibility of the client.

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

040800539

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1:	1601 2nd Avenue North	*Address1:*	1601 2nd Avenue North
Address2:	Suite 116	*Address2:*	Suite 116
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59404	*Zip/Post Code:*	59404
Country:	USA	*Country:*	USA
Contact Name:	Keith Cron	*Attn:*	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@tetratech.com	*Email:*	Keith.Cron@tetratech.com
EMSL Rep:	Stephen Siegel	*P.O. Number:*	
Project Name/Number:	1157720035.200 CMC Bozeman Facility - SI		

MATRIX			TURNAROUND			
☐ Air	☒ Soil	☐ Micro-Vac	☐ 3 Hours	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours (1 day)
☐ Bulk	☐ Drinking Water		☐ 48 Hours (2 days)	☐ 72 Hours (3 days)	☐ 96 Hours (4 days)	☐ 120 Hours (5 days)
☐ Wipe	☐ Wastewater		☒ 144+ hours (6-10 days)			

TEM AIR. 3 hours, 6 hours. Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours (must arrive by 11:00a.m. Mon -Fri.). Please Refer to Price Quote

PCM - Air	TEM Air	TEM WATER
☐ NIOSH 7400(A) Issue 2: August 1994	☐ AHERA 40 CFR, Part 763 Subpart E	☐ EPA 100.1
☐ OSHA w/TWA	☐ NIOSH 7402	☐ EPA 100.2
☐ Other:	☐ EPA Level II	☐ NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
☐ EPA 600/R-93/116	☐ Drop Mount (Qualitative)	☐ ASTM D 5755-95 (quantative method)
☐ EPA Point Count	☐ Chatfield SOP - 1988-02	☐ Wipe Qualitative
☐ NY Stratified Point Count	☐ TEM NOB (Gravimetric) NYS 198.4	
☐ PLM NOB (Gravimetric) NYS 198.1	☐ EMSL Standard Addition:	**XRD**
☐ NIOSH 9002:		☐ Asbestos
☐ EMSL Standard Addition:	**PLM Soil**	☐ Silica NIOSH 7500
SEM Air or Bulk	☐ EPA Protocol Qualitative	
☐ Qualitative	☐ EPA Protocol Quantitative	**OTHER**
☐ Quantitative	☐ EMSL MSD 9000 Method fiberstgram	☒ CARB 435

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC

Sent Via Fed Ex Tracking # 798347004364

W/ TEM EPA 1000 Point Count Method

040800539

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 19 - 31 minus 25 Total Samples #: 12

Relinquished: [signature] Date: 1/8/08 Time: P.M

Received: OM-fx-915A Date: Time:

Relinquished: Date: Time:

Received: Date: Time:

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
19 - Story - TP-1	Composite 1.5' - 4' (Story TP-1)	N/A
20 - Story - TP-1	Base 4' depth (Story - TP1)	
21 - Story - TP-2	3.5' - 4' depth (Story TP-2)	
22 - Story - TP-2	4' - depth (Story TP-2)	
23 - Story - TP-3	1.5' - 3' Composite (Story TP-3)	
24 - Story - TP-3	3' depth (Story TP-3)	
~~25 - Story - TP-3~~	~~3' depth duplicate (Story TP-3)~~	
26 - Story - TP-4	0' - 3' Composite (Story TP-4)	
27 - Story - TP-4	3' depth (Story TP-4)	
28 - Story - TP-5	0-3' Composite (Story TP-5)	
29 - Story - TP-5	3' Depth (Story TP-5)	
30 - Story - TP-7	0' - 3' Composite (Story TP-7)	
31 - Story - TP-7	3' Depth (Story TP-7)	

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL INC.

APPENDIX I

Asbestos Dust Sample Field Log Notes

TETRA TECH, INC.

CLIENT City of Bozeman DATE 12/17/07

JOB TITLE _____ JOB NUMBER 115772003S.200

SUBJECT Dust Sampling BY ZEE/NS SHEET 1 of 6

North Huntington Building - Main Level 1
South west Office / ~~Hall~~ / Bathroom

Sample ID # NHB - 1
1 - min sample / subsample
4 directions

Subsample #	Location	Accessibility	Time (Min)	Photo Log	Notes
1	~~Unlocked~~ Office ~~book shelf~~	Non	1		N. Wall bookshelf (NHB-1)
2	Office	Non	1		W. Wall top of chest (fabric) (7.5 ft) stacked chairs
3	Women's Bath	~~Non~~ Accessible	1		E Wall 12 x 12 Floor tile
4	Women's Bath	~~Inaccessible~~ in Frequent	1		N. Wall behind toilet (bleach
5	Men's Bath	Accessible	1		E Wall @ door threshold 12 x 12 floor tile
6	Men's Bath	in Frequent	1		S. Wall white toilet 12 x 12 floor tile
7	Men's Bath	Accessible	1		S Wall top of ceramic vanity 3 feet
8	Men's Bath	In Frequent	1		S. Wall top of 6' foot Wooden shelving unit
9	Office	Accessible	1		middle room carpet
10	Office	in Frequent	1		S. Wall Sheet vinyl behind shelving

TETRA TECH, INC.

CLIENT City of Bozeman DATE 12/17/07

JOB TITLE _____ JOB NUMBER 115772003S.200

SUBJECT Dust Sampling BY ~~JC~~ NS SHEET 2 of 6

North Huffman Building - Main Level
Show room / closet Area

Sample ID NHB-2
1-min sample / aliquot
4 directions

Subsample #	Location	Accessibility	Time	Photo Log	Notes
1	Str NW Showroom	inaccessible	1		storage area behind along plywood Desk
2	S. Showroom	accessible	1		tongue-n-groove wooden floor traffic area
3	NE showroom	infrequent	1		top of ~~shelf~~ microwave 4' from ground Steel surface
4	NE Showroom	accessible	1		Blue wooden floor access
5	NW showroom	accessible	1		Carpet N area within glass case area
6	Closet	accessible	1		~~carpet~~ wooden floor middle of room
7	S. Show	infrequent	1		S. wall top of blue desk shelf ~ 6'
4	S. Show	inaccessible	1		above SW office storage area plywood decking
9	S show	infrequent	1		top of steel filing cabinet along S. wall
10	NW show	infrequent	1		blue window sill plywood panel

Photo Log

TETRA TECH, INC.

CLIENT City of Bozeman DATE 12/17/07

JOB TITLE _____ JOB NUMBER 1157720035.200

SUBJECT Duct Sampling BY KL/NS SHEET 3 of 6

North Harrington Building - Main Level
Main Office/Storage Room # 1, 2

Sample ID # NHB-3
1-min sample / 1 liquid
4 drum hours

Subsample #	Location	Accessibility	Time	Notes
1	Entryway	accessible	1	Front entryway carpet mat brown pavers
2	Entryway	in fragment	1	on 12x12 floor tile by Coke Machine
3	Main Office	accessible	1	In front entryway on carpet
4	Main Office	in fragment	1	On top of E. Wall computer approx 4' off ground on plastic
5	Storage 1	in fragment	1	In closet along hardwood wall/shelf Clear
6	Storage 1	accessible	1	In main entry/pathway along carpet
7	Storage 2	accessible	1	In front of door along carpet E. Wall
8	Storage 2	in fragment	1	top of cardboard box W. Wall
9	Storage 2	inaccessible	1	above 2x4' drop down ceiling panel on W. side of light
10	Storage 1	inaccessible	1	along W wall above sink in base of wire rack along wood # Filter loaded

TETRA TECH, INC.

CLIENT City of Bozeman DATE 12/17/07

JOB TITLE _____ JOB NUMBER 115772005S.000

SUBJECT Dust Sampling BY ~~JE~~/NS SHEET 4 of 6

North Herrington Building - Main Level
~~Main Level office / Storage Room #1~~, 2 Dock

Sample ID # NHB-04
1-min Sample/obj

Subsample #	Location	Accessibility	Time	Notes
1	North Dock	accessible	1	Loading dock middle of Concrete
2	North Dock	accessible	1	Loading dock on top of package 3 ft S. wall
3	North Dock	infrequent	1	Loading dock on wood ~3 ft on top of saw
4	North Dock	accessible	1	Loading dock concrete N side
5	North Dock	infrequent	1	Loading dock east wall top of wood pallet
6	South Dock	accessible	1	Loading dock S. Room @ threshold on carpet
7	South Dock	infrequent	1	Loading dock S. Room NW corner MDF book shelf ~6' above ground
8	South Dock	inaccessible	1	Loading dock W wall top of plywood shelf ~7.5'
9	North Dock	inaccessible	1	Loading dock top of wooden crate ~8'
10	North Dock	infrequent	1	Loading dock S stairs N wall Concrete (top)

TETRA TECH, INC.

CLIENT City of Bozeman DATE 12/17/07

JOB TITLE _____ JOB NUMBER 115722003S.200

SUBJECT Dust Sampling BY ~~JCC~~/JS SHEET 5 of 6

South Huntington Building - Main level
Salvation Army shop & Bathroom

Sample ID # SHB - 1
1 min Sample / aliquot

Subsample #	Location	Accessibility	Time	Notes
1	Bathroom	accessible	1	S location along door along clearance to bathroom sheet vinyl
2	shop	accessible	1	black steel flashing along transition from N to S building
3	shop	infrequent	1	N wall concrete near building transition
4	shop	infrequent	1	Top of wood speaker along E. wall
5	shop	accessible	1	middle of shop on concrete floor along crack (joint) in concrete
6	shop	infrequent	1	S wall middle of shop along concrete floor in between boxes
7	shop	infrequent	1	middle of room on top of boxes (cardboard) approx 3-4 ft from ground
8	shop	accessible	1	top of 2' counter along middle of west wall
9	shop	infrequent	1	E wall concrete floor N. side S. of garage door
10	shop	accessible	1	middle bathroom floor along sheet vinyl

- by 5th aliquot samples failed

* No inaccessible

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC.

BY City of Bozeman DATE 12/17/07

JOB TITLE _____ JOB NUMBER 115772ue35 200

SUBJECT Dust Sampling 3rd/NS SHEET 5 16

North Huffington Building - 3rd Level
Big Sky, Montana

Sample ID # NHB-S
1 min / aliquot

Subsample #	Location	Accessibility	Time	Notes
1	main room	non	1	top of the changing room portion wall east side wood
2		non	1	top of changing room portion wall west side wood
3		~~accessible~~ infrequent	1	bottom shelf of coffee table wood
4		accessible	1	Carpet floor in front of changing room threshold
5		infrequent	1	stair ledge ~~Infrequent~~ wooden S wall
6		Accessible	1	Carpet floor infront of changing room threshold
7		infrequent	1	NW window sill wooden ~~2' from ground~~
8		infrequent	1	Inside East wall bookcase (cremoon) 4.5 ft from ground
~~9~~ 10		accessible	1	Middle of canvas dog mat
~~10~~ 9		accessible		1st step coming upstairs from attic level Carpet
*				

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC

BY Keith Coon / NS DATE 12/19/07

JOB TITLE CMC Bozeman Facility JOB NUMBER 115772003535.200

SUBJECT Dust Sampling SHEET 1 / 7

North Harrington Building - ~~3rd Floor~~ Main Level
B. Herroot Stained Glass shop and storage Room

Sample ID #NHB-6
1 min / 2 liquot
4 passes

Subsample #	Location	Accessibility	Time	Notes
1	Shop	in Frequent	1	West wall white painted wood window sill ~ 3' above
2	Shop	Accessible	1	West side in entryway along brown carpet
3	shop	in Frequent	1	N wall white painted wood window sill ~ 3' above ground
4	shop	accessible	1	middle of room carpeted table ~ 3' above floor
5	shop	inaccessible	1	middle of room above ceiling 2x4' tile approx. 7.5 ft above floor used explosives
6	Storage	accessible	1	West room @ doorway entrance on Carpet
7	Storage	accessible	1	East room near freight door along wood floor
8	Storage	in Frequent	1	N. Wall white painted window sill 3' above ground
9	storage	in Frequent	1	S wall book shelf wooden 6' above ground
10	storage	inaccessible	1	Middle of Room above 2x4' ceiling tile approx 7.5' ft above ground

MAXIM TECHNOLOGIES
A DIVISION OF TETRATECH, INC.

BY Keith Crow / NS DATE 12/18/07

JOB TITLE MC Bozeman Facility JOB NUMBER 115772003S. 200

SUBJECT Dust Sampling SHEET 2/7

North Harrington Building - Basement
Show room

Sample ID # NHB-7
1 min/aliquot
4 persons

Subsample	Location	Accessibility	Time	Notes
1	show Room	accessible	1	Concrete floor N W side of Building near freight elevator
2	Show Room	accessible	1	carpet floor near stairs middle
3	cleaning Area	inaccessible	1	on top of steel shelf along west wall ~7 ft off ground
4	cleaning Area	infrequent	1	middle wooden shelf S. side of cleaning room ~3 ft off ground
5	stairwell	accessible	1	bottom of stairwell on carpet step
6	shop	infrequent	1	top of wooden shelf ~4 ft off ground
7	shop	accessible	1.03	South side of basement along carpet
8	shop	infrequent	1	W. wall. plastic window sill ~5 ft from ground
9	shop	inaccessible	1	top of galvanized HVAC 16" duct
10	shop	infrequent	1	N side concrete floor near freight elevator

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC.

BY Heath Coon / NS DATE 12/18/07

JOB TITLE CMC Bozeman Facility JOB NUMBER 115772003S. 200

SUBJECT Dust Sampling SHEET 3/7

North Huntington Building - Basement
~~Show room~~ → HVAC Room

Sample ID = NHB-S
1 min / aliquot
4 passes

Subsample	Location	Accessibility	Time	Notes
1	HVAC Room	accessible	1	SW Corner Concrete floor near south door
2	HVAC Room	accessible	1	SE Corner Concrete floor
3	HVAC Room	accessible	1	NW Corner (N. Door) Concrete Floor
4	↓	accessible	1	NE Corner of Door Concrete floor
5	↓	infrequent	1	N. Top of Furnace (metal) approx. 4' from ground
6	↓	infrequent	1	S. Top of Furnace (metal) approx. 4' from ground
7	↓	infrequent	1	Top of hot water heater SE Corner metal ~ 5 ft from ground
8	↓	infrequent	1	Tape of metal 6" vent duct ~ 6.5' from ground
9	↓	inaccessible	1	bottom of HVAC Furnace (S) not in operation on concrete
10	↓	inaccessible	1	bottom of N HVAC Furnace in operation on Concrete

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC.

BY Heath Cron / NS DATE 12/18/07

JOB TITLE CMC Basement Facility JOB NUMBER 115772003S. 200

SUBJECT Dust Sampling SHEET 4/7

North Herrington Building - Basement
Shop / Office / Vault

Sample ID # NHB-9

Subsample	Location	Accessibility	Time	Notes
1	Office	accessible	1	along carpet in front of safe
2	office	infrequent	1	along N. Wall carpeted window sill 4'
3	office	inaccessible	1	top of 2x4' ceiling tile pounds 7' above
4	office	infrequent	1	top of clock wooden SW corner
5	Shop	accessible	1	Concrete floor middle of shop
6	Shop	accessible	1	E. Wall counter top (MDF) 3' from ground
7	Vault	accessible	1	middle of room concrete floor
8	~~Shop~~	infrequent	1	N. middle of room top of drill (metal) 5' from ground
9	Vault	infrequent	1	top of fridge metal 5' from ground
10	Vault	inaccessible	1	top of metal shelving unit along north wall 6.5' from ground

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC

BY Heath Cox / NS DATE 12/18/07

JOB TITLE CMC Bozeman Facility JOB NUMBER 115772003S. 200

SUBJECT Dust Sampling SHEET 5/7

North Harrington Building – Attic
South Showroom

Sample ID #
NHB – 10

Subsample	Location	Accessibility	Time	Notes
1	S. Building	accessible	1	Carpet @ top of stairs
2	S Showroom	accessible	1	Carpet in middle of space
3	S. Showroom	accessible	1	carpet in front of freight elevator
4	S Showroom	accessible	1	N showroom floor @ top of stair wall
5	S. Showroom	infrequent	1	W side plywood @ edge of space on floor
6	S. Showroom	infrequent	1	top of steel freight elevator approx. 8' from ground
7	S showroom	infrequent	1	E side along plywood floor
8	S showroom	infrequent	1	E. side along exposed ceiling joist (original construction)
9	S. Showroom	inaccessible	1	S. side top of ceiling truss approx 6.5 ft above floor
10	S. Showroom	inaccessible	1	N side near stairwell (behind TV's) ~~plywood decking~~ steel pipe

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC

BY Heath Cram /NS DATE 12/16/03

JOB TITLE CMC Bozeman Facility JOB NUMBER 115-7720035.200

SUBJECT Dust Sampling SHEET 6/7

North Huntington Building - Attic
North Showroom

Sample ID #
NHB-11

Subsample	Location	Accessibility	Time	Notes
1	Showroom	accessible	1	NE Corner along carpet
2	" "	accessible	1	middle of room along carpet
3	" "	accessible	1	SW side of room along carpet
4	" "	infrequent	1	SW side of corner ~~a~~ Fan sill plywood 6'
5	" "	inaccessible	1	Middle of room above 2x4' ceiling tile 8'
6	" "	infrequent	1	S wall of room along wooden book shelf "Dusty" 3'
7	" "	accessible	1	N W corner carpet
8	" "	infrequent	1	NW Corner wind sill Wooden White 3f above floor
9	" "	infrequent	1	N wall white wooden window sill 3'
10		inaccessible	1	E wall ceiling 2x4' ceiling tile above 8'

MAXIM TECHNOLOGIES
A DIVISION OF TETRA TECH, INC.

BY Keith Cron / NS DATE 12/18/07

JOB TITLE CMC Bozeman Facility JOB NUMBER 115772003S 200

SUBJECT Dust Sampling SHEET 7/7

North Hemingway Building - Attic

Breakroom / East Office / Hallway

Sample ID # NHB-12

Subsample	Location	Accessibility	Time	Notes
1	Break Room	accessible	1	brown carpet along floor
2	" "	infrequent	1	top of refrigerator steel surface 5'-5" off ground
3	" "	inaccessible	1	top of steel light ballast 7' from ground within steel grid ceiling structure
4	office	accessible	1	carpet @ door threshold
5	" "	infrequent	1	Top of wooden MDF bookcase W. wall 4' off ground
6	" "	" "	1	Top of wooden bookcase 6.5' off floor NW wall
7	" "	inaccessible	1	Top of 2x4 ceiling tile above ceiling plenum
8	Hall	accessible	1	bottom of Big Sky Akdo stairs along laminate floor
9	" "	infrequent	1	W. Wall top shoe rack 5' above floor
10	hall	accessible	1	Start of Big Sky Aikido hall Laminate floor

TETRA TECH

Daily Log

Project Name: CMC Bozeman Facility	Project No.: 115772003[illegible].200
Building:	Date: 12/17/07
Area: Dust Samples	Project Day No.: 1 of
Contractor:	Tetra Tech Personnel: NS / RC
Contractor Personnel:	Sheet: 1 of 1
ACM Removed:	
Estimated Percent of Phase Completed:	On Schedule? (circle): Yes No

GENERAL REMARKS/MEETINGS/SITE VISITS/CONTRACTOR PROGRESS:

0930 - N/S calibrate Dust Sample pumps

NHB - [illegible] - 1 ~~Time of Pre Cal~~ North Harrington Building Main Level Southwest Office / Mens and Womens Restroom

Start 0945 Stop ~ 1045 Pre/Post Cal after each Composite Sample

NHB - 2 ~~Start~~ NHB - Main Level Show Room / closet

Start ~~1100~~ 1100 Stop 1145 1150 post cal

Media Blank #1 Media Blank #2 - sent from lot # 60719

of 25 mm Dust Monitoring Cassettes 0.8 µm MCE Filter - (1055)

FB - 1 30 sec in air sample (1100) - 1145 post cal

12 - 1300 Lunch

1300 - 1310 - Precal NHB - 3 Main Level Front offices Storage Room # 1, 2

Start 1300 End - 1350 post cal 1400

1400 - ~~1430~~ 1430 Precal NHB - 4 Main Level East Deck Area 1430 Post Cal for deck

Industrial Hygiene Technician:	Reviewed By:

TETRA TECH

Daily Log

Project Name: CMC Bozeman Facility	Project No.: 115772035.200
Building: Harrington N. Building	Date: 12/18/07
Area: Dust Sampling	Project Day No.: 2 of
Contractor: NA	Tetra Tech Personnel: RC / NS
Contractor Personnel: NA	Sheet: 1 of 1
ACM Removed: NA	
Estimated Percent of Phase Completed:	On Schedule? (circle): Yes No

GENERAL REMARKS/MEETINGS/SITE VISITS/CONTRACTOR PROGRESS:

~0830 - Mob to site, wait for Jeff to open doors

~0900 - Enter Building Mob in

0930 - Start Stained Glass 1005 finish

10

1115 - Basement Show Room 1145 finish 1220

1250 - 120 - Discuss

1 hr

1335 1445 - NHB, Attic South Showroom

12/19/07

1650 - NHB - Big Sky Aikido

1725 Return Plenum sample in their HVAC Space in middle of ceiling 2 min sample

1730 NHB - 74 Main Level Return Plenum steel - subsample ~~A, B~~, 2 min 1 min/aliquot

- no 2nd Level Return viewable / - was abandoned only ran 1 min due to subsample could not be run

Industrial Hygiene Technician:

Reviewed By:

FB-1 → 30 SEC (NHB) 12.17.07

media blanks 1 & 2 → 12.17.07

TETRATECH MICROVAC CASSETTE LOT # 60719

AIR SAMPLE COLLECTION

Project:	CMC - Bozeman Facility	**Date:**	12.17.07 / 12.18.07
Building:	SI Workplan (Dust samples) / ~~Perimeter~~	**Calibration Instrument:**	DryCal (Bios) SN 102680
Location:	Harrington's	**IH Technician:**	Nathan Shuma
Project No.:	115772003.5, 200 → All NOT continuous	**Checked By:**	

Sample ID	Sample Description and Location	Pump ID	Start Time	Stop Time	Total Minutes	PRECALIBRATION Test #1	Test #2	Test #3	PRE Average Flow	POSTCALIBRATION Test #1	Test #2	Test #3	POST Average Flow	Volume (liters)
N. Harrington bldg NHB - [redacted] - 1	main level - SW office & men & women restroom	767954	10:30	10:50	10	Date/Time: 12.17.07				Date/Time: 12.17.07 / 10:50				
						2.004	2.004	2.004	2.004	2.085	2.087	2.089	2.087	20.46
NHB - 2	main level - S. showroom & N. showroom W/ closet		11:10	11:50	10	Date/Time: 12.17.07 / 11:10				Date/Time: 12.17.07 / 11:49				
						2.057	2.064	2.065	2.062	2.087	2.092	2.093	2.091	20.77
NHB - 3	main level - entryway, main office, storage 1, storage 2		13:15	13:55	10	Date/Time: 12.17.07 / 13:15				Date/Time: 12.17.07 / 13:50				
						2.075	2.084	2.086	2.082	2.104	2.125	2.105	2.111	20.97
NHB - 4	main level - E. dock AREA		14:00	14:40	10	Date/Time: 12.17.07 / 14:00				Date/Time: 12.17.07 / 14:30				
						2.014	2.014	2.013	2.014	1.960	1.962	1.963	1.962	19.89
SHB - 1 [redacted]	SALVATION ARMY shop & bathroom		14:40	15:15	10	Date/Time: 12.17.07 / 14:40				Date/Time: 12.17.07 / 3:15				
						2.003	1.987	1.989	1.993	2.012	2.034	2.015	2.020	20.07
NHB - 5	3rd LEVEL - Big Sky Aikido		15:20	15:55	10	Date/Time: 12.17.07 / 15.20				Date/Time: 12.17.07 / 15:50				
						2.007	2033	2.014	2.018	2.017	2.024	2.024	2.022	20.20
NHB - 6	main level - Bitterroot SHANGO glass shop & storage	767994	0935	10:05	10	Date/Time: 12.18.07 / 0930				Date/Time: 12.18.07 / 10:00				
						2.059	2.058	2.039	2.045	2.061	2.040	2.039	2.047	20.46
FB - 2	NHB	NA	←	—	0.5	Date/Time: 12.18.07 / 11:00				Date/Time:				
									NA				NA	NA
media blank - 3		NA				Date/Time: ~~12.18.07~~ / 11:02				Date/Time:				
media blank - 4		NA				Date/Time: 12.18.07 / 11:03				Date/Time:				
NHB - 7	NHB basement - showroom	767994	11:10	11:45	10	Date/Time: 12.18.07 / 11:10				Date/Time: 12.18.07 / 11:45				
						2.016	1.996	2.014	2.009	2.048	2.054	2.055	2.052	20.31
NHB - 8	NHB - basement HVAC room	767994	13:40	1430	10	Date/Time: 12.18.07 / 1343				Date/Time: 12.18.07 / 1420				
						2.050	2.030	2.030	2.037	2.047	2.047	2.043	2.047	20.42
NHB - 9	NHB - basement shop / office / lower	767994	1435	1510	10	Date/Time: 12.18.07 / 1430				Date/Time: 12.18.07 / 15.00				
						2.038	2.039	2.021	2.033	2.027	2.012	2.028	2.022	20.28
NHB - 10	NHB - Attic South showroom	767994	1510	1620	10	Date/Time: 12.18.07 / 1510				Date/Time: 12.18.07 / 1615				
						2.007	2.029	2.008	2.015	2.034	2.054	2.036	2.041	20.28
NHB - 11	NHB - Attic North showroom	767994	1620	1700	10	Date/Time: 12.18.07 / 16.21				Date/Time: 12.18.07 / 16:50				
						2.023	2.029	2.026	2.026	2.031	2.031	2.030	2.031	20.29
NHB - 12	NHB - Attic - Breakroom, E. office, hallway	767994	1700	1745	10	DATE/TIME: 12.18.07 / 17.02				DATE/TIME: 12.18.07 / 17.37				
						2.016	2.021	2.040	2.026	2.033	2.034	2.032	2.033	20.30

reset pump

↑ 12.17
↓ 12.18

TETRA TECH

AIR SAMPLE COLLECTION

Project: CMC Bozeman	Date: 12.19.07
Building: NHB	Calibration Instrument: Bios DryCal
Location:	IH Technician: NS / KC
Project No.:	Checked By:

NOT CONTINUOUS

Sample ID	Sample Description and Location	Pump ID	Start Time	Stop Time	Total Minutes	PRECALIBRATION Test #1	Test #2	Test #3	PRE Average Flow	POSTCALIBRATION Test #1	Test #2	Test #3	POST Average Flow	Volume (liters)
NHB-13	Big Sky Aikido -3rd floor HVAC RETURN PLENUM	798134	16:45	17:30	2	Date/Time: 12.19.07/16:45			1.983	Date/Time: 12.19.07/17:25			1.983	3.97
						1.966	1.991	1.993		1.968	1.998	1.984		
NHB-14	main floor HVAC RETURN	798134	17:30	17:45	1	Date/Time: 12.19.07/17:25			1.983	Date/Time: 12.19.07/17:40			1.964	1.97
						1.968	1.998	1.984		1.969	1.961	1.962		
						Date/Time:				Date/Time:				
						Date/Time:				Date/Time:				
						Date/Time:				Date/Time:				
						Date/Time:				Date/Time:				
						Date/Time:				Date/Time:				
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						Date/Time:				Date/Time:				
						Date/Time:				Date/Time:				
						Date/Time:				Date/Time:				

APPENDIX J

Asbestos Dust Sample Analytical Results

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731699

EMSL Proj:
Analysis Date: 2/2/2008
Report Date: 2/3/2008

Asbestos Analysis via Transmission Electron Microscopy ASTM Method D5755-03

SAMPLE ID	AREA SAMPLED (cm^2)	ASBESTOS TYPE	ASBESTOS STRUCTURES	Sensitivity (str/cm^2)	CONCENTRATION (str/cm^2)	COMMENTS
20 *040731699-0001*	0	None Detected	<3			Blank
21 *040731699-0002*	0	None Detected	<3			Blank
22 *040731699-0003*	1000	None Detected	<3	1990	<5970	
20 *31699-0020*	0	None Detected	<3			Blank
21 *040731699-0021*	0	None Detected	<3			Blank
22 *040731699-0022*	1000	None Detected	<3	1990	<5970	
23 *040731699-0023*	0	None Detected	<3			Blank
24 *040731699-0024*	0	None Detected	<3			Blank
25 *040731699-0025*	1000	None Detected	<3	332	<996	
26 *040731699-0026*	1000	None Detected	<3	996	<2990	
27 *040731699-0027*	1000	None Detected	<3	332	<996	

Analyst(s)

Theodore Xu (22)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731699

EMSL Proj:
Analysis Date: 2/2/2008
Report Date: 2/3/2008

Asbestos Analysis via Transmission Electron Microscopy ASTM Method D5755-03

SAMPLE ID	AREA SAMPLED (cm^2)	ASBESTOS TYPE	ASBESTOS STRUCTURES	Sensitivity (str/cm^2)	CONCENTRATION (str/cm^2)	COMMENTS
28 *040731699-0028*	1000	None Detected	<3	3320	<9960	
29 *040731699-0029*	1000	None Detected	<3	199	<597	
30 *040731699-0030*	1000	None Detected	<3	996	<2990	
31 *31699-0031*	1000	Amosite Chrysotile	<3	332	<996	
32 *040731699-0032*	1000	None Detected	<3	9960	<29900	
33 *040731699-0033*	1000	None Detected	<3	9960	<29900	
34 *040731699-0034*	1000	None Detected	<3	9960	<29900	
35 *040731699-0035*	1000	None Detected	<3	3320	<9960	
36 *040731699-0036*	1000	None Detected	<3	1990	<5970	
37 *040731699-0037*	100	None Detected	<3	1990	<5970	
38 *040731699-0038*	100	None Detected	<3	19900	<59700	

revised report- asbestos structure counting criteria of 3:1 used

Analyst(s)

Theodore Xu (22)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

TETRA TECH

Tetra Tech
1601 2nd Avenue North, Suite 116
Great Falls, Montana 59401
Tel: 406.453.1641 **Fax:** 406.771.0743

Fax

Date: 1/25/08

No. of pages including cover sheet: 8

To:	Steve Siegel	**From:**	Keith Crow
Company:	EMSL	Dept:	IH
Phone:	856 858 4800	Phone:	406 4531641
Fax:	856 858 4960	Fax:	
CC:			

☐ Urgent ☐ For your review ☒ Reply ASAP ☐ Please comment

Steve,

Please find attached (2) EMSL Laboratory Reports you provided analytical services for. For the NIOSH 7402 Method ran on the provided samples, please analyze them for (ISO Method 10312).

For the ASTM D 5755-03, please provide analytical results for a fiber ratio of 3:1 instead of the method-specified 5:1. Additionally, please note the changes to the area with dust wipe sampling as ~~was~~ all were greater than the 100 cm² specified.

Please call me with any additional questions. We can have a 6+ day turnaround time as well.

Thanks.

FED EX # 7909-0467-1511

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Company:	Tetra Tech	***Bill To:***	Tetra Tech
Address1:	1601 2nd Avenue North Suite 116	*Address1:*	1601 2nd Avenue North Suite 116
Address2:		*Address2:*	
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	U.S.A.	*Country:*	U.S.A.
Contact Name:	Keith Cron	***Attn:***	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@Tetratech.com	*Email:*	Keith.Cron@Tetratech.com
EMSL Rep:		***P.O. Number:***	
Project Name/Number: CMC Bozeman - 1157720035.200			

MATRIX			TURNAROUND			
☐ Air	☐ Soil	☑ Micro-Vac	☐ 3 Hours	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours (1 day)
☐ Bulk	☐ Drinking Water		☐ 48 Hours (2 days)	☐ 72 Hours (3 days)	☐ 96 Hours (4 days)	☐ 120 Hours (5 days)
☐ Wipe	☐ Wastewater		☑ 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours. Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

***12 hours (must arrive by 11:00a.m. Mon.-Fri.), Please Refer to Price Quote**

PCM - Air	**TEM Air**	**TEM WATER**
☐ NIOSH 7400(A) Issue 2: August 1994	☐ AHERA 40 CFR, Part 763 Subpart E	☐ EPA 100.1
☐ OSHA w/TWA	☐ NIOSH 7402	☐ EPA 100.2
☐ Other:	☐ EPA Level II	☐ NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
☐ EPA 600/R-93/116	☐ Drop Mount (Qualitative)	☑ ASTM D 5755-95 (quantative method)
☐ EPA Point Count	☐ Chatfield SOP - 1988-02	☐ Wipe Qualitative
☐ NY Stratified Point Count	☐ TEM NOB (Gravimetric) NYS 198.4	
☐ PLM NOB (Gravimetric) NYS 198.1	☐ EMSL Standard Addition:	**XRD**
☐ NIOSH 9002:		☐ Asbestos
☐ EMSL Standard Addition:	**PLM Soil**	☐ Silica NIOSH 7500
SEM Air or Bulk	☐ EPA Protocol Qualitative	
☐ Qualitative	☐ EPA Protocol Quantitative	**OTHER**
☐ Quantitative	☐ EMSL MSD 9000 Method fibers/gram	☐

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 20 - 38 Total Samples #: 19

Relinquished: Nathan Shumate Date: 12.27.07 Time: p.m

Received: Date: Time:

Relinquished: Date: Time:

Received: Date: Time:

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)	Area Sampled cm^2
20	NHB - media blank 1	NA	
21	NHB - media blank 2	↓	
22	SHB - 1 - Salvation Army shop & bathroom	20.1 L	1,000 cm^2
23	NHB - Field blank (FB-1)	NA	
24	NHB - Field blank (FB-2)	↓	
25	NHB-1: SW office/mens & womans bath	20.46 L	1,000 cm^2
26	NHB-2: S. showroom/N. showroom w/ closet	20.77 L	1,000 cm^2
27	NHB-3: main floor: · entry hall · main office · storage 1 & 2	20.97 L	1,000 cm^2
28	NHB-4: main level - east dock area	19.9 L	1,000 cm^2
29	NHB-5: 3rd level - Big Sky Aikido	20.2 L	1,000 cm^2
30	NHB-6: main floor: · Bitterroot stained glass shop & storage	20.5 L	1,000 cm^2
31	NHB-7: Basement showroom	20.5 L	1,000 cm^2
32	NHB-8 - Basement HVAC room	20.4 L	1,000 cm^2
33	NHB-9 - Basement: · shop · office · vault	20.3 L	1,000 cm^2

Page 2 of 2
3 3

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) SEE P6. 2 of 3 Total Samples #: _____

Relinquished: Nathan Shumate Date: 12-27-07 Time: p.m.

Received: _____ Date: _____ Time: _____

Relinquished: _____ Date: _____ Time: _____

Received: _____ Date: _____ Time: _____

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)	Area Sampled cm²
34	NHB-10 Attic Level: S. Showroom	20.3 L	1,000 cm²
35	NHB-11 Attic: N. Showroom	20.3 L	1,000 cm²
36	NHB-12 Attic: · Breakroom · E. office · Hallway	20.3L	1,000 cm²
37	NHB-13 3rd Floor - Big Sky Aikido HVAC return plenum	19.8 L	100 cm²
38	NHB-14 main floor HVAC return plenum	19.7 L	100 cm²

APPENDIX K

Asbestos Occupational Air Sample Analytical Results

EMSL

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 6/3/2008
Report Date: 06/04/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0001	
Customer Sample #:		45	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/DY	
Air volume:		0	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		133	
Analytical Sensitivity:		0.58	Structure/square mm
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	1.73	Structure/square mm
Concentration of Amphibole Asbestos:	<	1.73	Structure/square mm
Lower 95% Confidence Limit (Chrysotile)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.73	Structure/square mm
Lower 95% Confidence Limit (Amphibole)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.73	Structure/square mm
Concentration of Asbestos (total):	**<**	**1.73**	**Structure/square mm**

Comments: *Additional grid openings analyzed under EMSL order ID:04081235. Analysis occurred from original grid preps.*

Robyn Denton
Approved Signatory

EMSL

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 6/3/2008
Report Date: 06/04/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0002	
Customer Sample #:		46	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/DY	
Air volume:		0	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		66	
Analytical Sensitivity:		1.17	Structure/square mm
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	3.48	Structure/square mm
Concentration of Amphibole Asbestos:	<	3.48	Structure/square mm
Lower 95% Confidence Limit (Chrysotile)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	3.48	Structure/square mm
Lower 95% Confidence Limit (Amphibole)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	3.48	Structure/square mm
Concentration of Asbestos (total):	**<**	**3.48**	**Structure/square mm**

Comments: *Additional grid openings analyzed under EMSL order ID:04081235. Analysis occurred from original grid preps.*

Robyn Denton
Approved Signatory

EMSL

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 6/3/2008
Report Date: 06/04/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0003	
Customer Sample #:		47	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/DY	
Air volume:		0	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		124	
Analytical Sensitivity:		0.62	Structure/square mm
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	1.85	Structure/square mm
Concentration of Amphibole Asbestos:	<	1.85	Structure/square mm
Lower 95% Confidence Limit (Chrysotile)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.85	Structure/square mm
Lower 95% Confidence Limit (Amphibole)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.85	Structure/square mm
Concentration of Asbestos (total):	**<**	**1.85**	**Structure/square mm**

Comments: *Additional grid openings analyzed under EMSL order ID:04081235. Analysis occurred from original grid preps.*

Robyn Denton
Approved Signatory

EMSL

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 5/30/2008
Report Date: 05/30/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0004	
Customer Sample #:		48	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/RD	
Air volume:		932.6	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		144	
Analytical Sensitivity:		0.22	Structures/L
Number of Primary Asbestos Structures Counted:		1	
Number of total asbestos structures counted:		1	
Number of Asbestos Structures > 5 microns:		1	
Number of Asbestos fibers and bundles > 5 microns:		1	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	0.66	Structures/L
Concentration of Amphibole Asbestos:	<	0.66	Structures/L
Lower 95% Confidence Limit (Chrysotile)		Not Applicable	Structures/L
Upper 95% Confidence Limit (Chrysotile)	<	0.66	Structures/L
Lower 95% Confidence Limit (Amphibole)		Not Applicable	Structures/L
Upper 95% Confidence Limit (Chrysotile)	<	1.05	Structures/L
Concentration of Asbestos (total):	**<**	**0.66**	**Str./L**

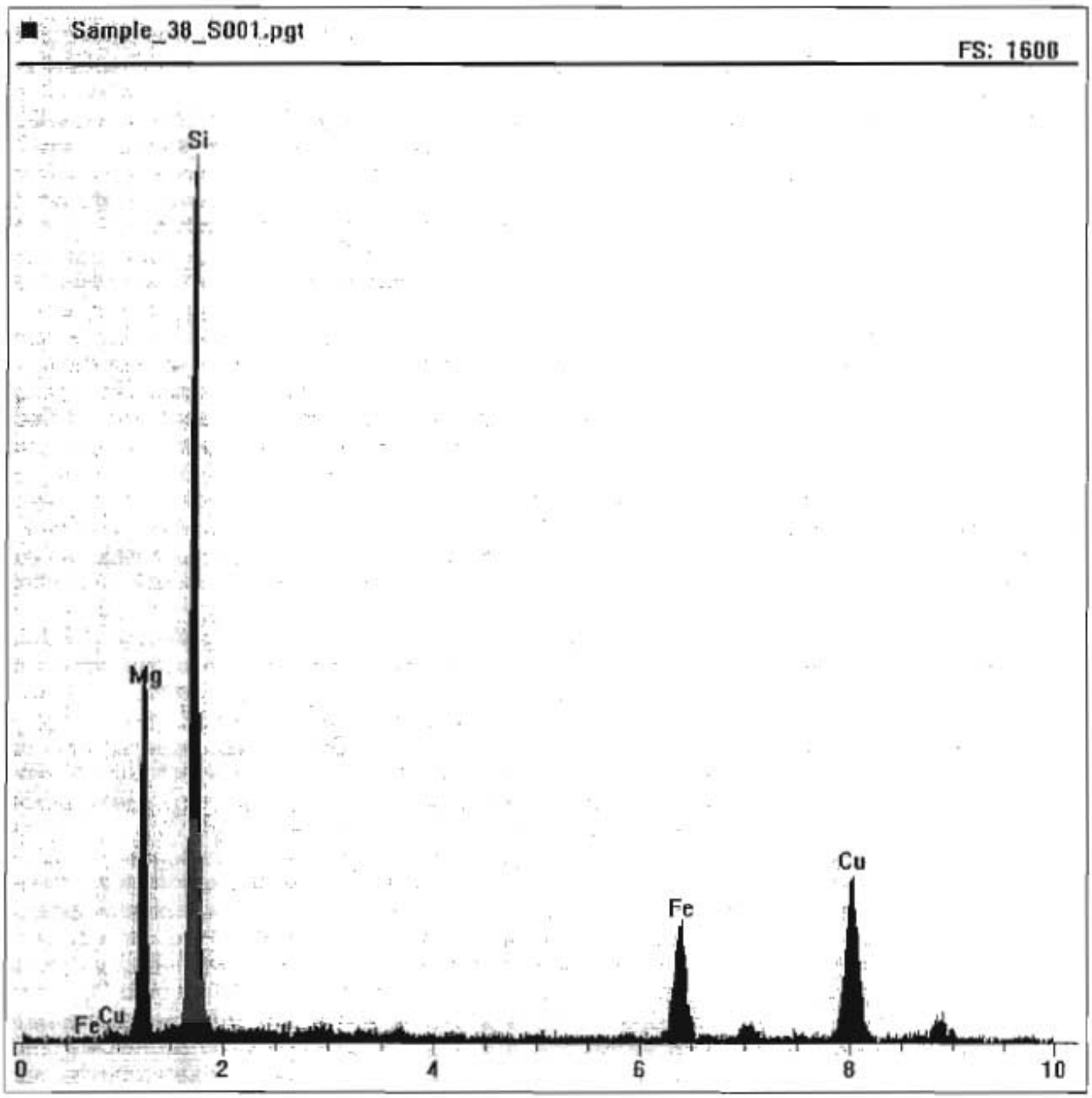
Robyn Denton
Approved Signatory

EMSL Analytical, Inc.

EDXA Spectrum

File: 040812357-0004 Anthophyllite
Collected: May 30, 2008 06:06:31

Live Time:	102.11	Count Rate:	726	Dead Time:	10.40 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 107 Haddon Avenue Westmont, NJ 08108
TEL: (800) 220-3675 • FAX: (856) 858-4960 • www.EMSL.com

EMSL

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 5/30/2008
Report Date: 05/30/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0005	
Customer Sample #:		49	
Date sampled:		12/27/2007	
Initials of Analyst:		DL	
Air volume:		857.7	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		92	
Analytical Sensitivity:		0.38	Structures/L
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	1.12	Structures/L
Concentration of Amphibole Asbestos:	<	1.12	Structures/L
Lower 95% Confidence Limit (Chrysotile)		Not Applicable	Structures/L
Upper 95% Confidence Limit (Chrysotile)	<	1.12	Structures/L
Lower 95% Confidence Limit (Amphibole)		Not Applicable	Structures/L
Upper 95% Confidence Limit (Chrysotile)	<	1.12	Structures/L
Concentration of Asbestos (total):	**<**	**1.12**	Structures/L

Robyn Denton
Approved Signatory

EMSL Analytical, Inc
Photomicrograph Report

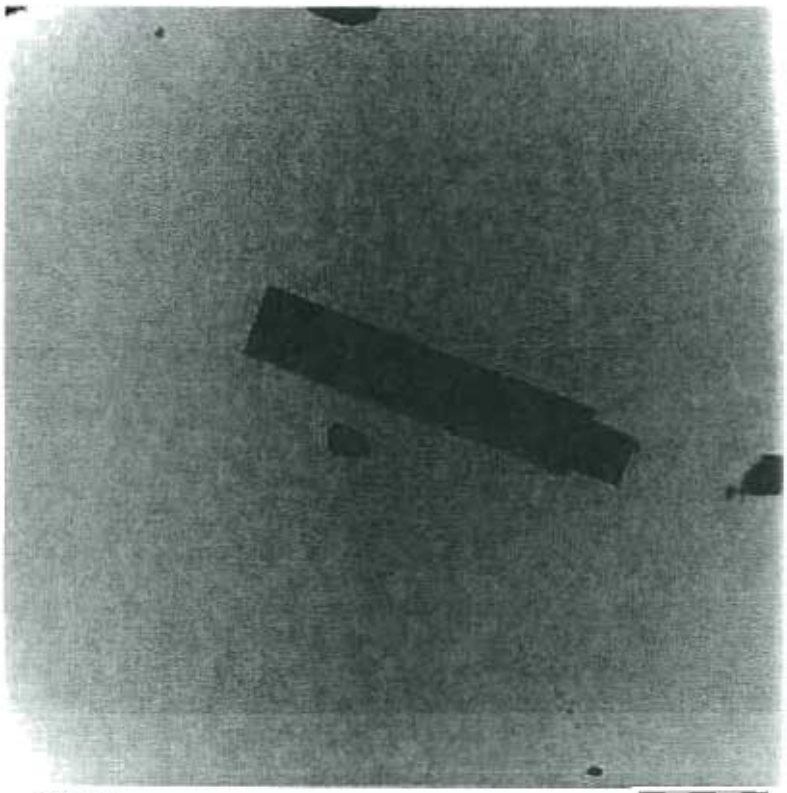


Image Information

Micrograph Number: 580519
Sample ID: 48
Order ID: 040802108
Asbestos Type: Anthophyllite
Magnification: 2500x
Camera Length: NA
Row Spacing: NA
Laboratory ID: EMSL 04

Comments:

107 Haddon Avenue
1-800-220-3675

Westmont, NJ 08108
www.emsl.com

Cron, Keith

From: Cron, Keith **Sent:** Thu 5/22/2008 7:05 AM
To: rdenton@emsl.com
Cc:
Subject: CMC Bozeman Facility EMSL Reference Order No. (040802108)
Attachments:

Robyn,

Per our conversations the past couple of days please find this email as notice to proceed with the reprocessing/reanalysis of the five samples previously analyzed by the ISO 10312 Method. For the reanalysis, I would like the sensitivity to be reduced to 0.0002 structures per cubic centimeter; therefore, I understand that EMSL will have to open approximately 160 new grids to perform the additional analysis to be included in the analytical result per sample. After discussing this with EMSL representatives, they have agreed on a price of $5/additional grid opening based on a normal turnaround schedule. The additional stipulation that I would like to put on the reanalysis is that a minimum of 10 grid openings be analyzed and continued to count structures until the required analytical sensitivity has been reached, based on the sample volume and the number of grid openings counted. The count may be terminated upon completion of the grid opening containing the 50th structure, regardless of whether or not the target analytical sensitivity has been reached.

If you have any additional question, feel free to call or email me. Please let me know when you think you will be done with the analysis as I may need to ask for an extension – on my end.

Thanks for all you help!

Keith Cron, CIH | Branch Manager
Cell: 406.788.5318 | Main: 406.453 1641 | Fax: 406.771.0743

Tetra Tech | Complex World, Clear Solutions™
1601 2nd Avenue North, Suite 116 | Great Falls, Montana 59401 | www.tetratech.com

TETRA TECH

Tetra Tech
1601 2nd Avenue North, Suite 116
Great Falls, Montana 59401
Tel: 406.453.1641 Fax: 406.771.0743

Fax

Date: 1/28/08

No. of pages including cover sheet: 8

To:	Steve Siegel	From:	Keith Crow
Company:	EMSL	Dept:	IH
Phone:	856 858 4800	Phone:	406 4531641
Fax:	856 858 4960	Fax:	
CC:			

☐ Urgent ☐ For your review ☒ Reply ASAP ☐ Please comment

Steve,

Please find attached (2) EMSL Laboratory Reports you provided analytical services for. For the NIOSH 7402 Method ran on the provided samples, please analyze them for (ISO Method 10312).

For the ASTM D 5755-03, please provide analytical results for a fiber ratio of 3:1 instead of the method-specified 5:1. Additionally, please note the changes to the area with dust wipe sampling as all were greater than the 100 cm² specified.

Please call me with any additional questions. We can have a 6+ day turnaround time as well.

Thanks.

040802108 - ISO 10312

FED EX # 7909-0467-1511

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1:	1601 2nd Avenue North Suite 116	*Address1:*	1601 2nd Avenue North Suite 116
Address2:		*Address2:*	
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	U.S.A.	*Country:*	U.S.A.
Contact Name:	Keith Cron	*Attn:*	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@Teratech.com	*Email:*	Keith.Cron@Tetratech.com
EMSL Rep:		*P.O. Number:*	
Project Name/Number: CMC Bozeman - 1157720035.200			

MATRIX			TURNAROUND			
☑ Air	☐ Soil	☐ Micro-Vac	☐ 3 Hours	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours (1 day)
☐ Bulk	☐ Drinking Water		☐ 48 Hours (2 days)	☐ 72 Hours (3 days)	☐ 96 Hours (4 days)	☐ 120 Hours (5 days)
☐ Wipe	☐ Wastewater		☑ 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote

PCM - Air	TEM Air	TEM WATER
☐ NIOSH 7400(A) [rev. 2: August 1994]	☐ AHERA 40 CFR, Part 763 Subpart E	☐ EPA 100.1
☐ OSHA w/TWA	☑ NIOSH 7402	☐ EPA 100.2
☐ Other:	☐ EPA Level II	☐ NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
☐ EPA 600/R-93/116	☐ Drop Mount (Qualitative)	☐ ASTM D 5755-95 (quantitative method)
☐ EPA Point Count	☐ Chatfield SOP - 1988-02	☐ Wipe Qualitative
☐ NY Stratified Point Count	☐ TEM NOB (Gravimetric) NYS 198.4	
☐ PLM NOB (Gravimetric) NYS 198.1	☐ EMSL Standard Addition:	**XRD**
☐ NIOSH 9002:		☐ Asbestos
☐ EMSL Standard Addition:	**PLM Soil**	☐ Silica NIOSH 7500
SEM Air or Bulk	☐ EPA Protocol Qualitative	
☐ Qualitative	☐ EPA Protocol Quantitative	**OTHER**
☐ Quantitative	☐ EMSL MSD 9000 Method (fiber/gram)	

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC.

04073164

FED EX # 7909-0467-1511

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s): 45 - 49 Total Samples #: 5

Relinquished: Nathan Shumate Date: 12-27-07 Time: P.M.

Received: KJ FX Date: Time: 940

Relinquished: Date: Time:

Received: Date: Time:

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
45	Field blank (FB-1)	NA
46	media Blank - 1	↓
47	media Blank - 2	↓
48	P-121707-01	932.6 L
49	P-121807-01	857.7 L
	SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC.	

TXPL 1/30/08

APPENDIX L

Quality Assurance Laboratory Results for Soil, Dust, and Air Samples

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasbjab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **1157720035.200 CMC BOZEMAN FACILITY - SI**

Customer ID: MAXI56
Customer PO:
Received: 01/09/08 9:15 AM
EMSL Order: 040800536

EMSL Proj:
Analysis Date: 1/16/2008
Report Date: 1/16/2008

PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	Location	Appearance	% Fibrous	% Non-Fibrous	% Type
25-STORY-TP-3 *040800536-0001*	3' DEPTH DUPLICATE (STORY TP-3)	Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
MDT-111307-Q1 *040800536-0002*	LAB QC	Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Delores Beard (2)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

040800536

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1:	1601 2nd Avenue North	*Address1:*	1601 2nd Avenue North
Address2:	Suite 116	*Address2:*	Suite 116
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59404	*Zip/Post Code:*	59404
Country:	USA	*Country:*	USA
Contact Name:	Keith Cron	*Attn:*	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@tetratech.com	*Email:*	Keith.Cron@tetratech.com
EMSL Rep:	Stephen Siegel	*P.O. Number:*	
Project Name/Number:	1157720035.200 CMC Bozeman Facility - SI		

MATRIX			TURNAROUND			
_ Air	X Soil	_ Micro-Vac	_ 3 Hours	_ 6 Hours	Same Day or 12 Hours*	_ 24 Hours (1 day)
_ Bulk	_ Drinking Water		_ 48 Hours (2 days)	_ 72 Hours (3 days)	_ 96 Hours (4 days)	_ 120 Hours (5 days)
_ Wipe	_ Wastewater		X 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours. Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours (must arrive by 11:00a.m. Mon.-Fri.). Please Refer to Price Quote

PCM - Air	**TEM Air**	**TEM WATER**
NIOSH 7400(A) Issue 2, August 1994	_ AHERA 40 CFR, Part 763 Subpart E	EPA 100.1
OSHA w/TWA	NIOSH 7402	_ EPA 100.2
_ Other:	EPA Level II	_ NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
EPA 600/R-93/116	_ Drop Mount (Qualitative)	ASTM D 5755-95 (quantitative method)
_ EPA Point Count	Chatfield SOP - 1988-02	_ Wipe Qualitative
_ NY Stratified Point Count	_ TEM NOB (Gravimetric) NYS 198.4	
_ PLM NOB (Gravimetric) NYS 198.1	EMSL Standard Addition:	**XRD**
NIOSH 9002:		Asbestos
EMSL Standard Addition:	**PLM Soil**	Silica NIOSH 7500
SEM Air or Bulk	_ EPA Protocol Qualitative	
Qualitative	EPA Protocol Quantitative	**OTHER**
_ Quantitative	_ EMSL MSD 9000 Method fibers/grams	X CARB 435 w/PLM

SAMPLES RECEIVED ON ICE AND INTACT FOR ANALYSIS

Sent Via Fed Ex Tracking # 798347004364

EPA 400 Point Count Method

040800536

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 25 and 32 ~~25~~ *

Total Samples #: 2

Relinquished: [signature] Date: 1/6/08 Time: P.M.

Received: ATM-FX-915A Date: Time:

Relinquished: Date: Time:

Received: Date: Time:

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
25-Story-TP-3	3' depth duplicate (Story TP-3)	N/A
	Lab QC	
	Re Analysis of EMSL	
	Sample # 040728462-0001	
	Tetra Tech Sample # MOT-111307-Q1	

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC.

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ 08108 Phone: 800-220-3675 Fax:856-858-4960

Client: Tetra Tech/Maxim Technologies
1601 2nd Avenue N Suite 116
Great Falls, MT 59401
Attention: Keith Cron
Fax: email **Phone:**781-251-0040
Project: CMC BOZEMAN-1157720035.200

EMSL Reference: 040731711

Date Received: 12/28/07
Date Analyzed: 01/04/08
Date Reported: 01/07/08

Asbestos Analysis of Soil via EPA 600/R-93/116 Method Utilizing Analytical Electron Microscopy (Section 2.5) with CARB 435 Prep (Milling) Level B for 0.1% Target Analytical Sensitivity

Client Sample ID	*EMSL Sample ID*	*Asbestos Type(s)*	*# of Asbestos Structures Detected*	*Analytical Sensitivity %*	*Asbestos Weight %*	*Comments*
19-HEEBS-TD-4	040731711-0001	**None Detected**	0	0.1	<0.1	

Debbie Little
Analyst

Stephen Siegel, CIH or Approved EMSL Signatory

EMSL maintains liability limited to cost of analysis. This method requires the laboratory to analyze the sample until the first fiber found compromises 5% of the total mass. Due to the size and mass of different asbestos fibers, the analytical sensitivity will vary between samples and may prevent the laboratory from achieving the target sensitivity on all samples. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL is not responsible for sample collection activities or analytical method limitations. Interpretation and use of results are the responsibility of the client.

C4C731711

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly

MAXI56

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1	1600 2nd Avenue North Suite 116	*Address1*	1600 2nd Avenue North Suite 116
Address2:		*Address2*	
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	U.S.A.	*Country:*	U.S.A.
Contact Name:	Keith Crom	*Attn:*	Keith Crom
Phone:	406.453.1641	*Phone*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Crom@Tetratech.com	*Email*	Keith.Crom@Tetratech.com
EMSL Rep:		*P.O. Number:*	
Project Name/Number:	CMC Bozeman - 1537720035.200		

MATRIX			TURNAROUND			
Air	✓ Soil	Micro-Vac	3 Hours	6 Hours	Same Day or 12 Hours*	24 Hours (1 day)
Bulk	Drinking Water		48 Hours (2 days)	72 Hours (3 days)	96 Hours (4 days)	120 Hours (5 days)
Wipe	Wastewater		✓ 144+ hours (6-10 days)			

TEM AHERA 3 hours, 6 hours. Please call ahead to schedule. There is a premium charge for 3-hour TEM, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours must arrive by 11:00am, Mon -Fri. Please Refer to Price Quote

CASE DUPLICATE

PCM - Air	TEM Air	TEM WATER
NIOSH 7400 A (rev. 2, August 1994)	AHERA 40 CFR, Part 763 Subpart E	EPA 100.1
OSHA w/TWA	NIOSH 7402	EPA 100.2
Other:	EPA Level II	NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
EPA 600/R-93/116	Drop Mount (Qualitative)	ASTM D 5755-95 (transfer method)
EPA Point Count	Chatfield SOP - 1988-02	Wipe Qualitative
NY Stratified Point Count	TEM NOB (Gravimetric) NYS 198.4	
PLM NOB (Gravimetric) NYS 198.1	EMSL Standard Addition	**XRD**
NIOSH 9002:		Asbestos
EMSL Standard Addition:	**PLM Soil**	Silica NIOSH 7500
SEM Air or Bulk	EPA Protocol Qualitative	
Qualitative	EPA Protocol Quantitative	**OTHER**
Quantitative	EMSL MSD 9000 Method (Modified)	✓ CARB 435 w/TEM

EPA 1000 POINT COUNT METHOD

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC.

Fed Ex # 7909- 0467- 1511

C4073171

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4961
(856) 427-1608
http://www.emsl.com

Please print all information legibly

Client Sample # (s): 19 - _____ Total Samples #: 1

Relinquished: JATHAN Shumate Date: 12-27-07 Time: P.M.

Received: KO FX Date: _____ Time: 940

Relinquished: _____ Date: _____ Time: _____

Received: _____ Date: _____ Time: _____

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
19- HEEBS - TP4	HEEBS TP-4 BASE Duplicate 3' Depth	N.A.

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731699

EMSL Proj:
Analysis Date: 2/2/2008
Report Date: 2/3/2008

Asbestos Analysis via Transmission Electron Microscopy ASTM Method D5755-03

SAMPLE ID	AREA SAMPLED (cm^2)	ASBESTOS TYPE	ASBESTOS STRUCTURES	Sensitivity (str/cm^2)	CONCENTRATION (str/cm^2)	COMMENTS
20 *040731699-0001*	0	None Detected	<3			Blank
21 *040731699-0002*	0	None Detected	<3			Blank
22 *040731699-0003*	1000	None Detected	<3	1990	<5970	
?0 *731699-0020*	0	None Detected	<3			Blank
∠1 *040731699-0021*	0	None Detected	<3			Blank
22 *040731699-0022*	1000	None Detected	<3	1990	<5970	
23 *040731699-0023*	0	None Detected	<3			Blank
24 *040731699-0024*	0	None Detected	<3			Blank
25 *040731699-0025*	1000	None Detected	<3	332	<996	
26 *040731699-0026*	1000	None Detected	<3	996	<2990	
27 *040731699-0027*	1000	None Detected	<3	332	<996	

Analyst(s)
Theodore Xu (22)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **CMC BOZEMAN-1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 12/28/07 9:40 AM
EMSL Order: 040731699

EMSL Proj:
Analysis Date: 2/2/2008
Report Date: 2/3/2008

Asbestos Analysis via Transmission Electron Microscopy ASTM Method D5755-03

SAMPLE ID	AREA SAMPLED (cm^2)	ASBESTOS TYPE	ASBESTOS STRUCTURES	Sensitivity (str/cm^2)	CONCENTRATION (str/cm^3)	COMMENTS
28 *040731699-0028*	1000	None Detected	<3	3320	<9960	
29 *040731699-0029*	1000	None Detected	<3	199	<597	
30 *040731699-0030*	1000	None Detected	<3	996	<2990	
31 *31699-0031*	1000	Amosite Chrysotile	<3	332	<996	
32 *040731699-0032*	1000	None Detected	<3	9960	<29900	
33 *040731699-0033*	1000	None Detected	<3	9960	<29900	
34 *040731699-0034*	1000	None Detected	<3	9960	<29900	
35 *040731699-0035*	1000	None Detected	<3	3320	<9960	
36 *040731699-0036*	1000	None Detected	<3	1990	<5970	
37 *040731699-0037*	100	None Detected	<3	1990	<5970	
38 *040731699-0038*	100	None Detected	<3	19900	<59700	

revised report- asbestos structure counting criteria of 3:1 used

Analyst(s)

Theodore Xu (22)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

TETRA TECH

Tetra Tech
1601 2nd Avenue North, Suite 116
Great Falls, Montana 59401
Tel: 406.453.1641 **Fax:** 406.771.0743

Fax

Date: 1/28/08

No. of pages including cover sheet: 8

To:	Steve Siegel	From:	Keith Cron
Company:	EMSL	Dept:	IH
Phone:	856 858 4800	Phone:	406 4531641
Fax:	856 858 4960	Fax:	
CC:			

☐ Urgent ☐ For your review ☒ Reply ASAP ☐ Please comment

Steve,

Please find attached (2) EMSL Laboratory Reports you provided analytical services for. For the NIOSH 7402 Method ran on the provided samples, please analyze them for (ISO Method 10312).

For the ASTM D 5755-03, please provide analytical results for a fiber ratio of 3:1 instead of the method-specified 5:1. Additionally, please note the changes to the area with dust wipe sampling as all were greater than the 100 cm² specified.

Please call me with any additional questions. We can have a 6+ day turnaround time as well.

Thanks.

FED EX # 7909-0467-1511

Chain of Custody

Asbestos Lab Services

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107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1:	1601 2nd Avenue North Suite 116	*Address1:*	1601 2nd Avenue North Suite 116
Address2:		*Address2:*	
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	U.S.A.	*Country:*	U.S.A.
Contact Name:	Keith Cron	*Attn:*	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@Tetratech.com	*Email:*	Keith.Cron@Tetratech.com
EMSL Rep:		*P.O. Number:*	
Project Name/Number: CMC Bozeman - 1157720035.200			

MATRIX			TURNAROUND			
☐ Air	☐ Soil	☒ Micro-Vac	☐ 3 Hours	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours (1 day)
☐ Bulk	☐ Drinking Water		☐ 48 Hours (2 days)	☐ 72 Hours (3 days)	☐ 96 Hours (4 days)	☐ 120 Hours (5 days)
☐ Wipe	☐ Wastewater		☒ 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote

PCM - Air
- ☐ NIOSH 7400(A) Issue 2: August 1994
- ☐ OSHA w/TWA
- ☐ Other:

PLM - Bulk
- ☐ EPA 600/R-93/116
- ☐ EPA Point Count
- ☐ NY Stratified Point Count
- ☐ PLM NOB (Gravimetric) NYS 198.1
- ☐ NIOSH 9002:
- ☐ EMSL Standard Addition:

SEM Air or Bulk
- ☐ Qualitative
- ☐ Quantitative

TEM Air
- ☐ AHERA 40 CFR, Part 763 Subpart E
- ☐ NIOSH 7402
- ☐ EPA Level II

TEM BULK
- ☐ Drop Mount (Qualitative)
- ☐ Chatfield SOP - 1988-02
- ☐ TEM NOB (Gravimetric) NYS 198.4
- ☐ EMSL Standard Addition:

PLM Soil
- ☐ EPA Protocol Qualitative
- ☐ EPA Protocol Quantitative
- ☐ EMSL MSD 9000 Method fibers/gram

TEM WATER
- ☐ EPA 100.1
- ☐ EPA 100.2
- ☐ NYS 198.2

TEM Microvac/Wipe
- ☒ ASTM D 5755-95 (quantitative method)
- ☐ Wipe Qualitative

XRD
- ☐ Asbestos
- ☐ Silica NIOSH 7500

OTHER
- ☐

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 20 - 38 Total Samples #: 19

Relinquished: Nathan Shumate Date: 12.27.07 Time: p.m

Received: Date: Time:

Relinquished: Date: Time:

Received: Date: Time:

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)	Area Sampled cm^2
20	NHB - media blank 1	NA	
21	NHB - media blank 2	↓	
22	SHB-1 - Salvation Army shop & bathroom	20.1 L	1,000 cm^2
23	NHB - Field blank (FB-1)	NA	
24	NHB - Field blank (FB-2)	↓	
25	NHB-1: SW office/mens & womans bath	20.46 L	1,000 cm^2
26	NHB-2: S. showroom/N. showroom w/ closet	20.77 L	1,000 cm^2
27	NHB-3: main floor: · entry hall · main office · storage 1 & 2	20.97 L	1,000 cm^2
28	NHB-4: main level - east dock area	19.9 L	1,000 cm^2
29	NHB-5: 3rd level - Big Sky Aikido	20.2 L	1,000 cm^2
30	NHB-6: main floor: · Bitterroot stained glass shop & storage	20.5 L	1,000 cm^2
31	NHB-7: Basement showroom	20.5 L	1,000 cm^2
32	NHB-8 - Basement HVAC room	20.4 L	1,000 cm^2
33	NHB-9 - Basement: · shop · office · vault	20.3 L	1,000 cm^2

Page 2 of 2
3 3

Chain of Custody

Asbestos Lab Services

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107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) SEE P6. 2 of 3 Total Samples #: _____

Relinquished: Nathan Shumate Date: 12.27.07 Time: p.m.

Received: _____ Date: _____ Time: _____

Relinquished: _____ Date: _____ Time: _____

Received: _____ Date: _____ Time: _____

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)	Area Sampled cm²
34	NHB-10 Attic Level: S. Showroom	20.3 L	1,000 cm²
35	NHB-11 Attic: N. Showroom	20.3 L	1,000 cm²
36	NHB-12 ATTIC: · BREAKROOM · E. OFFICE · HALLWAY	20.3L	1,000 cm²
37	NHB-13 3rd Floor - Big Sky Aikido HVAC RETURN PLENUM	19.8 L	100 cm²
38	NHB-14 main floor HVAC RETURN PLENUM	19.7 L	100 cm²

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 6/3/2008
Report Date: 06/04/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0001	
Customer Sample #:		45	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/DY	
Air volume:		0	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		133	
Analytical Sensitivity:		0.58	Structure/square mm
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	1.73	Structure/square mm
Concentration of Amphibole Asbestos:	<	1.73	Structure/square mm
Lower 95% Confidence Limit (Chrysotile)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.73	Structure/square mm
Lower 95% Confidence Limit (Amphibole)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.73	Structure/square mm
Concentration of Asbestos (total):	**<**	**1.73**	**Structure/square mm**

Comments: *Additional grid openings analyzed under EMSL order ID:04081235. Analysis occurred from original grid preps.*

Robyn Denton
Approved Signatory

EMSL

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 6/3/2008
Report Date: 06/04/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0002	
Customer Sample #:		46	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/DY	
Air volume:		0	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		66	
Analytical Sensitivity:		1.17	Structure/square mm
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	3.48	Structure/square mm
Concentration of Amphibole Asbestos:	<	3.48	Structure/square mm
Lower 95% Confidence Limit (Chrysotile)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	3.48	Structure/square mm
Lower 95% Confidence Limit (Amphibole)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	3.48	Structure/square mm
Concentration of Asbestos (total):	**<**	**3.48**	**Structure/square mm**

Comments: *Additional grid openings analyzed under EMSL order ID:04081235. Analysis occurred from original grid preps.*

Robyn Denton
Approved Signatory

Attention: Keith Cron
Tetra Tech / Maxim Technologies
1601 2nd Avenue N, Suite 116
Great Falls, MT 59401

Fax: 406-771-0743 Phone: 406-453-1641
Project: CMC Bozeman
1157720035.200

Customer ID: MAXI53
Customer PO:
Received: 01/27/08

EMSL Order: 040802108
Analysis Date: 6/3/2008
Report Date: 06/04/08

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		040802108-0003	
Customer Sample #:		47	
Date sampled:		12/27/2007	
Initials of Analyst:		DL/DY	
Air volume:		0	Liters
Area of collection filter:		385	square mm
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		5:1	
Mean dimension of grid openings:		0.013	square mm
Number of Grid Openings Analyzed:		124	
Analytical Sensitivity:		0.62	Structure/square mm
Number of Primary Asbestos Structures Counted:		None Detected	
Number of total asbestos structures counted:		None Detected	
Number of Asbestos Structures > 5 microns:		None Detected	
Number of Asbestos fibers and bundles > 5 microns:		None Detected	
Number of PCM equivalent asbestos structures:		Not Analyzed	
Number of PCM equivalent asbestos fibers:		Not Analyzed	
Concentration of Chrysotile Asbestos:	<	1.85	Structure/square mm
Concentration of Amphibole Asbestos:	<	1.85	Structure/square mm
Lower 95% Confidence Limit (Chrysotile)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.85	Structure/square mm
Lower 95% Confidence Limit (Amphibole)		NA	Structure/square mm
Upper 95% Confidence Limit (Chrysotile)	<	1.85	Structure/square mm
Concentration of Asbestos (total):	**<**	**1.85**	**Structure/square mm**

Comments: *Additional grid openings analyzed under EMSL order ID:04081235. Analysis occurred from original grid preps.*

Robyn Denton
Approved Signatory

Cron, Keith

From: Cron, Keith **Sent:** Thu 5/22/2008 7:05 AM
To: rdenton@emsl.com
Cc:
Subject: CMC Bozeman Facility EMSL Reference Order No. (040802108)
Attachments:

Robyn,

Per our conversations the past couple of days please find this email as notice to proceed with the reprocessing/reanalysis of the five samples previously analyzed by the ISO 10312 Method. For the reanalysis, I would like the sensitivity to be reduced to 0.0002 structures per cubic centimeter; therefore, I understand that EMSL will have to open approximately 160 new grids to perform the additional analysis to be included in the analytical result per sample. After discussing this with EMSL representatives, they have agreed on a price of $5/additional grid opening based on a normal turnaround schedule. The additional stipulation that I would like to put on the reanalysis is that a minimum of 10 grid openings be analyzed and continued to count structures until the required analytical sensitivity has been reached, based on the sample volume and the number of grid openings counted. The count may be terminated upon completion of the grid opening containing the 50th structure, regardless of whether or not the target analytical sensitivity has been reached.

If you have any additional question, feel free to call or email me. Please let me know when you think you will be done with the analysis as I may need to ask for an extension – on my end.

Thanks for all you help!

Keith Cron, CIH | Branch Manager
Cell: 406.788.5318 | Main: 406.453.1641 | Fax: 406.771.0743

Tetra Tech | Complex World, Clear Solutions ™
1601 2nd Avenue North, Suite 116 | Great Falls, Montana 59401 | www.tetratech.com

TETRA TECH

Tetra Tech
1601 2nd Avenue North, Suite 116
Great Falls, Montana 59401
Tel: 406.453.1641 **Fax:** 406.771.0743

Fax

Date: 1/28/08

No. of pages including cover sheet: 8

To: Steve Siegel
Company: EMSL
Phone: 856 858 4800
Fax: 856 858 4960
CC:

From: Keith Cron
Dept: IH
Phone: 406 4531641
Fax:

☐ Urgent ☐ For your review ☒ Reply ASAP ☐ Please comment

Steve,

Please find attached (2) EMSL Laboratory Reports you provided analytical services for. For the NIOSH 7402 Method ran on the provided samples, please analyze them for (ISO Method 10312).

For the ASTM D 5755-03, please provide analytical results for a fiber ratio of 3:1 instead of the method-specified 5:1. Additionally, please note the changes to the area with dust wipe sampling as all were greater than the 100 cm² specified.

Please call me with any additional questions. We can have a 6+ day turnaround time as well.

Thanks.

040802108 - ISO 10312

FED EX # 7909-0467-1511

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1:	1601 2nd Avenue North Suite 116	*Address1:*	1601 2nd Avenue North Suite 116
Address2:		*Address2:*	
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	U.S.A.	*Country:*	U.S.A.
Contact Name:	Keith Cron	*Attn:*	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:	406.771.0743	*Fax:*	406.771.0743
Email:	Keith.Cron@Tetratech.com	*Email:*	Keith.Cron@Tetratech.com
EMSL Rep:		*P.O. Number:*	
Project Name/Number: CMC Bozeman - 1157720035.200			

MATRIX			TURNAROUND			
☑ Air	☐ Soil	☐ Micro-Vac	☐ 3 Hours	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours (1 day)
☐ Bulk	☐ Drinking Water		☐ 48 Hours (2 days)	☐ 72 Hours (3 days)	☐ 96 Hours (4 days)	☐ 120 Hours (5 days)
☐ Wipe	☐ Wastewater		☑ 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote

PCM - Air	TEM Air	TEM WATER
☐ NIOSH 7400(A) Issue 2: August 1994	☐ AHERA 40 CFR, Part 763 Subpart E	☐ EPA 100.1
☐ OSHA w/TWA	☑ NIOSH 7402	☐ EPA 100.2
☐ Other:	☐ EPA Level II	☐ NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
☐ EPA 600/R-93/116	☐ Drop Mount (Qualitative)	☐ ASTM D 5755-95 (quantative method)
☐ EPA Point Count	☐ Chatfield SOP - 1988-02	☐ Wipe Qualitative
☐ NY Stratified Point Count	☐ TEM NOB (Gravimetric) NYS 198.4	
☐ PLM NOB (Gravimetric) NYS 198.1	☐ EMSL Standard Addition:	**XRD**
☐ NIOSH 9002:		☐ Asbestos
☐ EMSL Standard Addition:	**PLM Soil**	☐ Silica NIOSH 7500
SEM Air or Bulk	☐ EPA Protocol Qualitative	
☐ Qualitative	☐ EPA Protocol Quantitative	**OTHER**
☐ Quantitative	☐ EMSL MSD 9000 Method fibers/gram	

SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL

040731694

FED EX # 7909-0467-1511

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) 45 - 49 Total Samples #: 5

Relinquished: Nathan Shuman Date: 12-27-07 Time: p.m.

Received: KD FX Date: Time: 940

Relinquished: Date: Time:

Received: Date: Time:

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
45	Field blank (FB-1)	NA
46	media blank - 1	↓
47	media blank - 2	↓
48	P-121707-01	932.6 L
49	P-121807-01	857.7 L
	SAMPLES ACCEPTED FOR ANALYSIS BY EMSL ANALYTICAL, INC.	

TXPA 1/30/08

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Keith Cron**
Tetra Tech/Maxim Technologies
1601 2nd Avenue N
Suite 116
Great Falls, MT 59401

Fax: (406) 771-0743 Phone: (406) 453-1641
Project: **1157720035.200**

Customer ID: MAXI56
Customer PO:
Received: 06/11/08 10:40 AM
EMSL Order: 040814203

EMSL Proj:
Analysis Date: 6/13/2008
Report Date: 6/13/2008

PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	Location	Appearance	% Fibrous	% Non-Fibrous	% Type
SHB-TP2 *040814203-0001*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
SHB-TP2 DUPLICATE *040814203-0002*		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Delores Beard (2)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

C4CE1423

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

MAXI56

Company:	Tetra Tech	*Bill To:*	Tetra Tech
Address1:	1601 2nd Avenue North	*Address1:*	1601 2nd Avenue North
Address2:	Suite 116	*Address2:*	Suite 116
City, State:	Great Falls, Montana	*City, State:*	Great Falls, Montana
Zip/Post Code:	59401	*Zip/Post Code:*	59401
Country:	USA	*Country:*	USA
Contact Name:	Keith Cron	*Attn:*	Keith Cron
Phone:	406.453.1641	*Phone:*	406.453.1641
Fax:		*Fax:*	
Email:	Keith.Cron@tetratech.com	*Email:*	Keith.Cron@tetratech.com
EMSL Rep:	Stephen Siegel	*P.O. Number:*	
Project Name/Number:	1157720035.200		

MATRIX			TURNAROUND			
☐ Air	☒ Soil	☐ Micro-Vac	☐ 3 Hours	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours (1 day)
☐ Bulk	☐ Drinking Water		☒ 48 Hours (2 days)	☐ 72 Hours (3 days)	☐ 96 Hours (4 days)	☐ 120 Hours (5 days)
☐ Wipe	☐ Wastewater		☐ 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours. Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

*12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote

PCM - Air	**TEM Air**	**TEM WATER**
☐ NIOSH 7400(A) Issue 2: August 1994	☐ AHERA 40 CFR, Part 763 Subpart E	☐ EPA 100.1
☐ OSHA w/TWA	☐ NIOSH 7402	☐ EPA 100.2
☐ Other:	☐ EPA Level II	☐ NYS 198.2
PLM - Bulk	**TEM BULK**	**TEM Microvac/Wipe**
☐ EPA 600/R-93/116	☐ Drop Mount (Qualitative)	☐ ASTM D 5755-95 (quantative method)
☐ EPA Point Count	☐ Chatfield SOP - 1988-02	☐ Wipe Qualitative
☐ NY Stratified Point Count	☐ TEM NOB (Gravimetric) NYS 198.4	
☐ PLM NOB (Gravimetric) NYS 198.1	☐ EMSL Standard Addition:	**XRD**
☐ NIOSH 9002:		☐ Asbestos
☐ EMSL Standard Addition:	**PLM Soil**	☐ Silica NIOSH 7500
SEM Air or Bulk	☐ EPA Protocol Qualitative	
☐ Qualitative	☐ EPA Protocol Quantitative	**OTHER**
☐ Quantitative	☐ EMSL MSD 9000 Method fibers/gram	☒ CARB Method 435 w/PLM EPA 400 Point Count Method

Sent Via FedEx # 791053774487

040814X3

Chain of Custody

Asbestos Lab Services

EMSL Analytical, Inc.
107 Haddon Avenue
Westmont, NJ 08108

Phone: (856) 858-4800
Fax: (856) 858-4960
(856) 427-1608
http://www.emsl.com

Please print all information legibly.

Client Sample # (s) SHB-TP2 0-.5' - SHB-TP2 2.5-3.0' Total Samples #: 6

Relinquished: [signature] Date: 6/10/04 Time: [illegible]

Received: DM-FX-1040A Date: _____ Time: _____

Relinquished: _____ Date: _____ Time: _____

Received: _____ Date: _____ Time: _____

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
SHB-TP2	0-0.5'	
SHB-TP2	0.5'-1.0'	
SHB-TP2	1.0'-1.5'	Composite Samples and analyze one for TP-2
SHB-TP2	1.5'-2.0'	
SHB-TP2	2.0'-2.5'	Duplicate 0-3'
SHB-TP2	2.5'-3.0'	

APPENDIX M

Data Validation Reports

TETRA TECH

June 16, 2008

Mr. Tim Cooper
P.O. Box 1230
Bozeman, Montana 59771

RE: CMC Bozeman Facility – SI Work Plan
Data Validation Report – Asbestos PLM
Soil Investigation

Mr. Cooper:

In accordance with the City of Bozeman's (City's) agreement with Tetra Tech dated December 7, 2007, Tetra Tech is providing data validation for soil samples we collected from the specified test pits as approved by the Montana Department of Environmental Quality's (DEQ) *CMC Bozeman Asbestos Facility DEQ-Approval of Supplemental Investigation (SI) Work Plan – Final Revision* dated December 6, 2007.

This validation report is applicable specifically to the 34 soil samples analyzed by polarized light microscopy (PLM) using the California Air Resources Board (CARB) Method 435 for sample preparation for both 0.1% and 0.25% analytical sensitivity, as stipulated. These samples included 10 test pit samples from the South Harrington Building (SHB) property including six base test pit samples, three composite test pit samples, and one composite duplicate sample; 10 test pit samples from the Heeb's Grocery (Heeb's) alleyway including five base test pit samples, four composite test pit samples, and one base duplicate sample; 12 test pit samples from the Story Distributing (Story) property including six base test pit samples, five composite test pit samples, and one base duplicate sample; additionally, one laboratory blank sample was reanalyzed and compared to an existing known value.

The samples were analyzed by EMSL Analytical, Inc. in five laboratory batches.

DELIVERABLES

All laboratory document deliverables were present as specified in the approved aforementioned DEQ-Approved SI Work Plan:

x_____ YES _____ NO

All documentation of field procedures was provided as required:

x_____ YES _____ NO

Tetra Tech
1601 2nd Avenue South, Suite 116 Great Falls, Montana 59401
Tel 406.453.1641 Fax 406.771.0743 www.tetratech.com

FIELD QUALITY CONTROL SAMPLES

Blanks

Work Plan Specified:
1 per 18 composite test pit side wall samples
1 per 18 base test pit samples

Actual Frequency:
0 per 12 composite test pit side wall samples
1 per 17 base test pit samples

Duplicates

Work Plan Specified:
1 per 18 composite test pit side wall samples
1 per 18 base test pit samples

Actual Frequency:
1 per 12 composite test pit side wall samples
2 per 17 base test pit samples

Comments:

One of the original test pit sample locations on the Story TP-6 was determined by visual inspection to have been previously excavated and replaced with engineered backfill material used as fill; therefore, soil sample collection was unnecessary. Additionally, several of the composite test pits throughout the study area were deemed unnecessary due to vertical depth of asbestos ore laden soil down to the native soil and/or three feet as is represented with only the collection of 12 composite samples. None of the 10 soil sample results were above limits of detection for their respective analytical method. The blank sample submitted did not contain asbestos above the limit of detection; one sample was only collected because the actual number of base and composite samples was reduced; thereby decreasing the blank sample requirement to samples collected ratio. One of the base samples was assessed to 0.1% point count analysis and confirmed not to contain asbestos ore laden soil as requested for 10% of the soil samples.

Laboratory Procedures

Laboratory procedure followed for asbestos: EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% and/or 0.1% analytical sensitivity.

x_____ YES _____ NO

Detection Limits

Project detection limits were set at 0.25% using 400-point count PLM Method with 10% samples analyzed using 0.1% 1000-point count PLM Method

Reported detection limits complied with project required detection limits:

x_____ YES _____ NO

Duplicate Readings

According to EMSL Analytical, Inc., one out of every 10 samples is read by another analyst for quality control.

Laboratory Control Standards

The analysts are required to read prepared samples to maintain their National Voluntary Laboratory Accreditation Program (NVLAP) certifications. Analysts are tested quarterly.

Data Quality Objectives

Project data quality objectives met:

x_____ YES _____ NO

Accuracy

The overall accuracy objectives were met, as the analysts are certified and routinely tested to ensure they can accurately read laboratory quality control samples.

Precision

The overall precision objectives were met, as the duplicate samples were within control limits.

Completeness

All of the test pits intended for asbestos PLM analysis were sampled and analyzed using the methods specified in the SI Work Plan. The overall completeness objectives were met and data deemed valid.

Report Prepared By:

Keith Cron, CIH

Report Reviewed By:

Daphne Digrindakis

TETRA TECH

June 16, 2008

Mr. Tim Cooper
P.O. Box 1230
Bozeman, Montana 59771

RE: CMC Bozeman Facility – SI Work Plan
Data Validation Report – Asbestos TEM
Occupational Air Investigation

Mr. Cooper:

In accordance with the City of Bozeman's (City's) agreement with Tetra Tech dated December 7, 2007, Tetra Tech is providing data validation for the occupational air samples collected from areas in the North Harrington Building (NHB) and South Harrington Building (SHB), as approved by the Montana Department of Environmental Quality's (DEQ) *CMC Bozeman Asbestos Facility DEQ-Approval of Supplemental Investigation (SI) Work Plan – Final Revision* dated December 6, 2007, throughout a typical work day for Mr. Jeff Harrington.

This validation report is applicable specifically to the dust samples analyzed in accordance with International Standards Organization (ISO) Method 10312:1995, with the caveat of performing analysis using an analytical sensitivity level of 0.0002 structure per cubic centimeter, as specified in the aforementioned work plan. These samples included two occupational air samples of two separate day's work tasks.

The samples were analyzed by EMSL Analytical, Inc. in one laboratory batch.

DELIVERABLES

All laboratory document deliverables were present as specified in the approved aforementioned DEQ-Approved SI Work Plan:

x_____ YES _____ NO

All documentation of field procedures was provided as required:

x_____ YES _____ NO

Tetra Tech
1601 2nd Avenue South, Suite 116 Great Falls, Montana 59401
Tel 406.453.1641 Fax 406.771.0743 www.tetratech.com

FIELD QUALITY CONTROL SAMPLES

Media Blank
Work Plan Specified:
1 samples from the lot of filter media cassettes

Actual Frequency:
2 samples from Lot No. 7209770275 from Environmental Monitoring Systems

Field Blank
Work Plan Specified:
1 per 10 samples analyzed (10%)

Actual Frequency:
1 per 2 samples analyzed (50%)

Comments:

One single asbestos fiber (anthophyllite) was noted in sample number P-121807-01, when the analytical sensitivity was at 0.00022 structures per cubic centimeter of air. Field blank and field media samples did not indicate a detectable quantity with respect to asbestos fibers.

Laboratory Procedures

Laboratory procedure followed for asbestos: ISO Method 10312 using Transmission Electron Microscopy.

x_____ YES _____ NO

Detection Limits

Detection limits were set at 0.0002 structures per cubic centimeter of air. Due to the reanalysis of the grid openings and the fact that some grid openings could not be opened, the two sets of data collected were at detection limits of 0.00022 and 0.00038 structures per cubic centimeter of air. These respective detection limits were within 91% and 53% of the specified amount; however, were within the same order of magnitude.

Reported detection limits complied with project required detection limits:

_____ YES x_____ NO

Duplicate Readings

According to EMSL Analytical, Inc., one out of every 10 samples is read by another analyst for quality control.

Laboratory Control Standards

The analysts are required to read prepared samples to maintain their National Voluntary Laboratory Accreditation Program (NVLAP) certifications. Analysts are tested quarterly.

Data Quality Objectives

Project data quality objectives met:

x_____ YES _____ NO

Accuracy

The overall accuracy objectives were met, as the analysts are certified and are routinely tested to ensure they can accurately read laboratory quality control samples.

Precision

The overall precision objectives were met, as the duplicate samples were within control limits.

Completeness

The two air samples analyzed for asbestos TEM analysis were sampled and analyzed using the methods specified in the SI Work Plan. The overall completeness objectives were met and data deemed valid for respective analytical sensitivities.

Report Prepared By:

Keith Cron, CIH

Report Reviewed By:

Daphne Digrindakis

TETRA TECH

June 16, 2008

Mr. Tim Cooper
P.O. Box 1230
Bozeman, Montana 59771

RE: CMC Bozeman Facility – SI Work Plan
Data Validation Report – Asbestos TEM
Dust Investigation

Mr. Cooper:

In accordance with the City of Bozeman's (City's) agreement with Tetra Tech dated December 7, 2007, Tetra Tech is providing data validation for the dust samples collected from areas in the North Harrington Building (NHB) and South Harrington Building (SHB), as approved by the Montana Department of Environmental Quality's (DEQ) *CMC Bozeman Asbestos Facility DEQ-Approval of Supplemental Investigation (SI) Work Plan – Final Revision* dated December 6, 2007.

This validation report is applicable specifically to the dust samples analyzed in accordance with American Standard for Testing and Materials (ASTM) Method D 5755-03, with the caveat of performing analysis using a 3 to1 aspect ratio as specified in the aforementioned work plan. These samples included one dust sample from the South Harrington Building (SHB) interior, 14 dust samples from the North Harrington Building (NHB) interior, two media blanks, and two field blanks. The interior samples were collected to gather a subsample ratio of four accessible areas, four infrequently accessed areas, and two inaccessible areas to arrive at a total of 10 subsamples for each assessed area.

The samples were analyzed by EMSL Analytical, Inc. in one laboratory batch.

DELIVERABLES

All laboratory document deliverables were present as specified in the approved aforementioned DEQ-Approved SI Work Plan:

x_____ YES _____ NO

All documentation of field procedures was provided as required:

x_____ YES _____ NO

Tetra Tech
1601 2nd Avenue South, Suite 116 Great Falls, Montana 59401
Tel 406.453.1641 Fax 406.771.0743 www.tetratech.com

FIELD QUALITY CONTROL SAMPLES

Media Blank
Work Plan Specified:
2 samples from the lot of filter media cassettes

Actual Frequency:
2 samples from Lot No. 60719 from Environmental Monitoring Systems

Field Blank
Work Plan Specified:
1 per 10 samples analyzed (10%)

Actual Frequency:
2 per 15 samples analyzed (13%)

Comments:

One single sample had a detectable chrysotile fiber (NHB – 6) collected from the Main Floor (Bitterroot Stained Glass in the shop and storage room). Additional samples including media and field blanks did not have detectable quantities of asbestos. Two samples (NHB-13 and NHB-14) collected from the 3rd Floor Big Sky Aikido Heating Ventilation and Air Conditioning (HVAC) Return Plenum and Main Floor HVAC Return Plenum, respectively were collected with only one aliquot comprising 100 square centimeters; these specific aliquot samples represent separate HVAC zones on different floors, and did not have any additional HVAC return plenums associated along these separate HVAC zones.

Laboratory Procedures

Laboratory procedure followed for asbestos: ASTM Method D5755-03 with 3 to 1 aspect ratio specified using Transmission Electron Microscopy.

x_____ YES _____ NO

Detection Limits

Sensitivity and/or detection limit based on dilution values used during dispersion techniques as “less” dirty samples allow for higher quantification levels due to dilution factors.

Reported detection limits complied with project required detection limits:

x_____ YES _____ NO

Duplicate Readings

According to EMSL Analytical, Inc., one out of every 10 samples is read by another analyst for quality control.

Laboratory Control Standards

The analysts are required to read prepared samples to maintain their National Voluntary Laboratory Accreditation Program (NVLAP) certifications. Analysts are tested quarterly.

Data Quality Objectives

Project data quality objectives met:

x_____ YES _____ NO

Accuracy

The overall accuracy objectives were met, as the analysts are certified and routinely tested to ensure they can accurately read laboratory quality control samples.

Precision

The overall precision objectives were met, as the duplicate samples were within control limits.

Completeness

The dust sample areas intended for asbestos TEM analysis were sampled and analyzed using the methods specified in the SI Work Plan. The overall completeness objectives were met and data deemed valid.

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